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....DU PONT NEGATIVE

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What to Read

Next Month

● Philip M. Choncellor, A.S.C., who hos been doing much work on color still photogrophy ond who hos been o student of this type of photographic ort for mony yeors will contribute his first orticle next month on this interesting work.

● A very interesting development in one of the studios of o device for the comero which mokes shooting more efficient will possibly be one of the outstonding bits of interesting reod-ing in next month's issue.

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Shooting through store window, note reflections without pola-screen.

Practical

THE new Eastman "Pola-Screens" differ from all other screens in that there is no element of uncertainty connected with their use. Visual inspection of the image on the ground glass shows precisely the effect that will carry through to the final print. Tricky variations of lighting and atmosphere, color-transmission, color-sensitivity, laboratory treatment, and so on, which can at times deceive even the most experienced technician in matters of filtering, have nothing to do with the action of the pola-screen: if you see the desired result on the ground glass, you will see it in the negative.

For the benefit of those who have not read the excellent article explaining these screens, which appeared in the last issue of this journal, it may be repeated here that pola-screens are not filters in any sense of the word, but screens which, rightly manipulated, can cut out the plane-polarized light rays which produce glare, reflections, etc., while having no effect upon the diffuse, un-polarized rays which we use to form our picture. This action can best be understood by the following rough simile: if you focus a lamp (such as a standard "18," for instance) upon an object or surface, you often get a strong glary reflection from that surface; in some instances, as for example polished metal surfaces, you get an image of the lamp itself. If you place a diffusing screen on the lamp, these reflections and the glare are lessened. In the first instance, you get the glare because a great percentage of the light-rays are parallel, vibrating in essentially the same plane; striking the surface together, they tend to reflect together. In the second instance, the diffuser has somewhat scattered the rays; striking from innumerable angles, they reflect diffusely, so that we see the object itself, rather than a glaring reflection of the light. Often in nature these two types of light rays travel together, and to get the best picture, we should in some way separate the glare-producing rays from the diffuse rays which we want to make our picture.

That is what the pola-screen does. When rotated to the proper angle, it stops the parallel, glare-producing rays, but lets the scattered ones which form the image of the object go through unchanged. This is why the action of the pola-screen can be determined visually.

The use of these screens is wholly a matter of angles. With the lens pointed at the object at a certain angle, the pola-screen will give the maximum result; at other angles, the glare-eliminating action is increasingly less. In the same way, the pola-screen itself must be rotated to the angle at which it most completely stops the glare-components of the light; at other angles, its action is progressively less, until at right angles (90°) to the optimum position, it actually increases the glare in many instances.

What are these angles? For eliminating reflections, glare on water, and so on, the camera should be shooting the object at an angle of 32°. For eliminating the glare from "hot" skies, and for getting darkened skies such as we get with a red filter, but without changing color-rendition of other areas, the lens should be pointed at an angle of 90° **away** from the sun: in morning or evening, either north or south; at noon, around the horizon in any direction. The position of the screen itself must always be found by visual inspection; this is very simple, for half a turn of the screen will instantly reveal at which position it is most effective.

Obviously, then, the pola-screen is not one of those devices that can be put on a camera and virtually forgotten. Far from it: it is very decidedly a tool for special occasions. Either you need it badly—or you don't need it at all. If you don't need it, while it can hardly do any harm if left on the camera, it will serve no useful purpose, and will eat up quite a bit of light, for its multiplying factor is 4.

For this latter reason, too, it would seem that the pola-screen will find its greatest usefulness in exterior photography. On the stages, where the Cinematographer has his lighting under perfect control, there should be less need for the pola-screen's glare-eliminating ability—and the fact that the screens demand two full stops increase in exposure is definitely a disadvantage when filming interiors.

The question has sometimes been asked, "is it not possible to get the same general results by using neutral density filters, rather than the pola-screens?" The answer to this is a decided negative. The Neutral Density filter (even the graduated filters of this type) acts over the whole area of the picture. The pola-screen, on the other hand, is definitely selective. Where, with a pola-screen, you can reduce or eliminate glare from any given area, without in any way altering any other part of the field, with a Neutral, you "tone down" not only the glare, but every other part of the picture as well.

In the comparatively short time since pola-screens were made available in Hollywood, a number of studios and indi-

Same scene as opposite page, but pola-screen is used to wipe out reflections.

Angles on the Use of Pola-Screens

by
Clyde De Vinna, A.S.C.

vidual Cinematographers have made tests of them; some few have even had opportunities to use them on actual production. Therefore, while it is yet too early to say with any finality how far their uses extend, we can already cite several examples of their application to practical production problems.

For instance, applied to the problem of toning down "hot" skies, and producing red-filtered sky effects, pola-screens have proven that they can produce a wide range of effects from a light grey sky down to an almost black one for special effects—and at all times do this without changing the rendition of other colors, such as faces, and the like. As a rule, too, it may be said that this action is less dependent upon the purity of the sky's color than is conventional filtering.

To a limited extent, also, these screens will eliminate the glare from brilliantly lighted white walls, roofs, and the like.

Shooting into a strong back-light against water, as at the seashore, has always been regarded as a difficult problem. In a test made by the writer, such a situation was chosen. The scene was made at the beach, with a pier extending seaward from the camera, several people and a bit of beach in the foreground, against a background of surging water illuminated by a brilliant, high back-light, and a "hot" sky. Without the pola-screen, the shot was almost a silhouette: the figures were virtually silhouetted, there was no separation between the sea and sky, both of which were lost in a blaze of white glare, into which the end of the pier also melted. Rotating the pola-screen to its optimum position, the glare was almost entirely eliminated: the tone of the water was darkened from white to a fairly dark grey; the figures stood out clearly, with an apparent increase of detail in the shadows due to the removal of the glare; the end of the pier became pleasingly visible. Since the lens was pointed almost directly toward the angle from which the sun shone, the sky was not affected; and since the highlights from the curving crests of the waves did not always present the ideal 32° angle to the lens, enough of these moving catch-lights remained to give a pleasing effect.

Similarly, tests made by Virgil Miller, A.S.C., indicate that by using pola-screens, shots into water can be made, eliminating all glare and reflections from the surface, and showing rocks, fish, divers and so on to a considerable depth.

Reflections from plate-glass store windows are frequently very troublesome, especially when working on location. Tests have shown that pola-screens will eliminate these reflections almost entirely, and a few days ago, Leon Shamroy, A.S.C., used the screens to simplify such a problem on actual production. The action required the camera to follow one of the players past a large store-window and into the store. Across the street was a large, light-colored building in brilliant sunlight; in the normal course of events, the reflection of this building would have made the shot absolutely impossible: at best, the scene would have had to be made in cuts, from less favorable angles. Thanks to the pola-screen, the shot was made as written, quickly and easily.

In the same way, reflections from the highly polished sides of automobiles can give the Cinematographer infinite trouble, and slow up production expensively. Milton Krasner, A.S.C., encountered two such shots recently, and solved the problem with polarizing screens. One of these scenes was a travelling-shot, in which camera, perambulator, track, etc, reflected strongly in the side of the car. A twist of the pola-screen—and the reflections were wiped away! The other shot was a stationary one, in which the best lighting required a reflector at exactly the point where it would also reflect in the car. The pola-screen eliminated the reflection of the reflector—but did not affect the light it threw on the player: a case of "killing" the reflector but keeping its light!

Henry Freulich, A.S.C., in the course of his tests of the screens, was particularly impressed with their ability to darken skies under atmospheric conditions where no ordinary filter could be used. Photographers of outdoor films will agree that at certain times of the year the sky takes on a whitish glare which defies even the strongest rec

(Continued on Page 387)

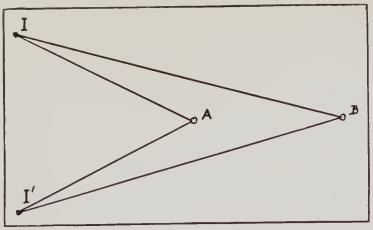


Fig. 1.

Are Third-

FROM the time the first "living picture" flickered ocross o screen, technicions and loymen alike have dreamed of the ideal cinemo, which would combine sound, color ond noturol depth. Todoy we hove occepted sound os a commonploce, ond color is edging toword reol perfection; the copture of the elusive "third dimension" of depth, olone remains unoccomplished. Populor opinion, in consequence, has seized upon stereoscopy os the next great odvonce expected of film technique. Scarcely a month goes by without its rumors and printed reports of some new process which will ot lost bring lifelike relief to the screen: but none of these miracle-working processes hove as yet shown up in actual production.

A shot-gun fired ot o world map would give a fair idea of the locotion and the number of inventors who ore wrestling with the problem. Literolly millions of dollors have been spent in pursuit of the will-o-the-wisp of stereoscopy.

It is not the purpose of this article to make disparaging remarks obout the conscientious investigotor. I should be glod to help such individuals as much os possible. But I have no use for the promotionol inventor who interests people to invest money in schemes he himself knows to be unworkoble. I have on almost equol disrespect for him who through ignoronce of the technicol essentiols of the problem he is seeking to solve, squanders the savings of investors. Equolly culpable is the sincere worker who in o misguided ottempt to ovoid plagiorism, neglects to inform himself of whot hos previously been done in the field. The secret of invention is exact knowledge of one's problem, ond of prior attempts at its solution. The wise investor, too, learns something ot leost of the fundamentals of the problem before putting up his money.

Whot, then, ore the fundomental focts of stereoscopy?

We see things stereoscopically becouse we hove binocular vision—because we hove two eyes. Conversely, o camero photogrophs things flot becouse it hos only one eye—its lens. All thot is necessory for stereoscopic motion pictures is to hove a binoculor comero ond to present the results to the oudience so thot each eye sees its appropriote picture.

When we observe o scene, eoch eye sees o different view; that is, the two pictures ore not alike: the vorious components of the one picture bear o different relotionship to eoch other thon they do in the other picture. This is called "parallax." In Figure One, I ond I' represent two eyes. A and B represent two posts. Eye I sees post B on the left side of post A; eye I' sees post B on the right side of post A. If we focus our ottention on post A—that is, converge our eyes so the principal line of sight of each eye crosses thot of its mate ot post A—then we sholl be conscious thot post B is now opparently double. We can quickly change our vision and focus our attention on post B, when it will seem to be a single post; at the same time we ore conscious thot post A now appeors double. It is apporent, then, thot two photographs token from points I and I' will not superimpose, for the pictures are dissimilor. We moy not at all times be wholly aware of it, but our broin olways gets a double impression of every object in the scene we are viewing except that particular point or object upon which we are concentrating at the instont. Each time we chonge the point of concentration to a closer or more distant point in the scene, oll objects which are forword or bock of this concentrotion point are shifted from their former relotionship. If the object in the foreground is narrower than the distance between our eyes, then to our binocular vision no port of the background is obscured. We con actually see oround this object.

Now, if we make o pair of photographs from positions I and I', and present them in such a way that the beholder's right eye sees only the picture mode from the right-hand viewpoint, and the left eye sees only the left-hond picture, we shall recreate not only form, but the sense of depth and roundness os well.

This is what the ordinory stereocope does. The photographs are mode in o duol comera, with two lenses approximately 2½ inches opart. The prints (which may be either conventional paper positives or transparencies) are viewed in o device which allows eoch eye to see only its proper print.

On a laborotory scole, this can be done with fair success in motion pictures: but it invoriably requires the use of individual viewing-devices by eoch member of the oudience—which rules it out os o commercial proposition. Quite o voriety of processes of this type hove been proposed. Among them are systems in which the two pictures ore printed on double-cooted stock, dyed in complementary colors, ond viewed through individuol spectacles hoving lenses of these colors, eoch of which filters out the unwonted image; others in which synchronized shutters perform the same service; ond yet others depending on polarized light to secure the separation.

In ony event, such systems con hardly be applied to film entertoinment os we know it todoy. So our definition of stereoscopic motion pictures must specify not olone the creotion of the illusion of depth and roundness, but o system which will permit us to go into the theatre as we now do—with no eye oids whatsoever—and enjoy this sense of depth and roundness from ony seot in the house. A lorge order, indeed!

Surprisingly enough, this con be done with ordinary equipment under more or less normol circumstonces; in fact it is being done quite frequently todoy! But here's the rub—it is done by a trick which con be used in normal production only in rare instonces! Mony years ago o picture was exhibited, colled "Cobiria," in which it was claimed stereoscopic results were ottained. It was also claimed that the method ond opparatus were potented. The principle wos to hove the camero olways moving on a radiol track, with the octian toking ploce at the center of the rodius. One can reodily visuolize the results! The relotive motion of the various plones, combined with the everchonging viewpoint, gove o distinct sense of relief. Everyone is familior with the effect of relief gained in o motion

Dimensional Motion Pictures Possible?

by
George A. Mitchell, Hon. A.S.C.
Member of Research Committee,
American Society of Cinemotographers

picture mode fram a moving object. Not everyone, however, knows that this trick, in oddition ta its legitimate uses, hos many times been used to misguide investors, and has lured much money into the pockets af unscrupulous promaters.

Ruling aut both these tricks af perspective and the un-commerciol eye-oids, let us consider, in the light af the principles olready illustrated in Fig. 1, the overage inventor's approach to stereoscopic motian pictures. Mast of them start with the presumption thot if two pictures ore taken from the viewpoints I and I', either an two separate films or alternately on the same film, then projected stereascopic results will follow. We have seen from Fig. 1 what will happen. If the axes af the lenses ore shifted to converge on post A, then in each alternote projected picture post B will first be on one side af A and then on the other. Point A will be stereoscopic, but oll ather points in view will oppear ta oscillate with point A as the oxis. The ropidity of the oscillotian will be the some as the speed of projection, and the amplitude af oscillatian will be the some os the distonce between I ond I'.

To orrive at these results many thousonds of dallars have been spent on speciol cameros and equipment. Also, at this point, mast of the experiments cease—the inventor begins to reolize the complexity of the problem, ond abondons the ideo.

These results moy eosily be proven at practically no cost by setting up o motion picture comero on some suitoble still-life scene, centering corefully on same object, ond morking the starting frome. Then with the stap-motion cronk expose eoch olternote frome, capping the lens between exposures. Expose os mony feet os desired, rewind the film to the storting point, shift the comero to one side about pupillory distance (appraximately 2½"). Again center on the some object as previously (by panning the comera), and expose the other frames in the some monner as before. A Bell & Howell camera lends itself admirably ta this experiment, as the camera may be shifted sideways eosily in its mounting davetoil.

Mony inventars proceed fram this point assuming the solution lies in some trick opticol system—prisms seem to be the most cammon panacea—to carrect the oscillation. But no distartion or prism system can chonge the relotive positian of objects in a scene. Their relationship to eoch other is determined completely the moment we select the point from which they ore to be photagraphed.

When we secure an optical system which will carrect this trouble, we will find that we hove ogoin o flat picture. Stereoscapy hos vonished—and we ore back at the starting point.

One ideo, out of the many tried ta overcame this difficulty, might be mentioned as being somewhat different fram the general run af schemes. In this case it is assumed thot all rays passing through a lens fram o given object are brought ta o focus at the same point. Then o lens af large diameter might hove two apertures located off center ot opposite sides of the axis. If naw alternote exposures are mode thraugh these apertures, stereoscopic pictures would result.

Unfortunately, this idea does nat work. Referring to Fig. 1, let I and I' be the twa apertures. The conditions in front of the lens ore the same as if twa separate lenses were used. But back of the lens anather condition naw exists, an explonation of which is of interest. A lens af large diameter, when fitted with twa apertures, creates twa images of a given object, side by side, ond while with parallel focol planes set at on ongle behind the lens, will bring the twa images af this object together, since the condition in frant of the lens has nat been changed. We have the same old trauble that abjects at different distances in the scene bear a different relationship one to the other.

A stereoscopic still photograph which may be compared with Fig. 1. The chauffeur and the lady may be likened to points A and B in the diagram.

L. Wm. O'Connell, A.S.C.

A Disciple of Elimination—

L. Wm. O'Connell, A.S.C.

by
Harry Burdick

IT APPEARS to be the fortune of L. William O'Connell, in conduct of his cinematographic career, to participate in incidents fraught with more than a modicum of informative interest to his contemporaries.

Of timely import are his current experiences with the new Eastman Pola-screen, which device for the ready control of polarized light for photographic purposes is described in the preceeding number of this journal.

Immediately the screen was announced and its laboratory claims set forth, Fox studios procured the device and turned it over to O'Connell for use under definite controls, that its value under prevailing production problems might be established.

Already an engrossed student of the topic, O'Connell found occasion for immediate practical demonstration of the device in his "Ball of Fire," then in process of lensing. In three days he found four applications for it during course of his scheduled routine.

The first instance was an exterior scene at a laundry building with all-glass walls. It was specified that the shot was to be made through the glass revealing action within the building. Naturally, it was desired the glass reflect no images of the street, nearby buildings or the camera company at work. The customary expedient of erecting a frame carrying black cloth encircling the set is, of course, known. This involves time, labor, expense. O'Connell brought into use his Pola-screen instead. Results were perfect.

Later that day, the location called for use of a stationary street car. When O'Connell arranged his reflectors to light the action, he encountered serious reflection from the polished windows and the flat varnished surface of the car side. With the Pola-screen in proper position he was able to eliminate oblique reflections from glass and varnish, at the same time preserving a wanted high-lighting in the windows.

The following day, under intense reflected sunlight, an automobile of impeccable polish was to be filmed. By means of the Pola-screen, O'Connell obtained a clean, sharp image with no distracting highlights.

The third day found him at the shore. Apparent color of the sea is, of course, a reflection of sky tone. The Pola-screen, O'Connell found, enabled him to capture the natural color of the water irrespective of color of the sky. During the morning it was hazy and overcast. The Pola-screen established a definite horizon. Later in the day, under bright clear sky, it provided the same desired separation.

On all of these scenes, O'Connell made protection shots —in the customary fashion without the screen. Not one of them found its way out of the cutting room, so superior were the Pola-screened takes. Their superiority in every respect, reports O'Connell, was so marked as to offer no grounds for comparison. In fact, he states, fully to appreciate the screen, one should view a series of scenes taken with and without it—a sort of before-and-after contrast.

The device is easy and simple to use. Much better effects are had with less effort and expense. Just a bit of excess exposure is needed. O'Connell enthusiastically concludes from his practical tests of the Pola-screen, "It it the greatest individual tool the cinematographer has been given."

Possibly one reason the Pola-screen so forcibly appealed to him from his first hearing of it is the fact that the device is fundamentaly an eliminator. For O'Connell, in his scheme of cinematographic philosophy, might well be termed "the great eliminator." To him, the art of imprisoning images of visual actuality on celluloid for the purpose of later audience approbation, resolves itself to a series of eliminations of always-existant imperfections, in the set or the character.

The cinematographically perfect set has yet to be built; the perfect face yet to be born. Nature, herself, is replete with imperfections glaringly apparent to lens and negative.

So, whether with set or character, O'Connell methodically erases with his lights the objectionable features his camera picks up. One by one he blankets them from view until only the good and desirable qualities remain. These he photographs.

He is not a subscriber to lighting gymnastics. Rather, he is a sane and thoughtful craftsman of scenes cinemat-

(Continued on Page 386)

Release-Prints Reflect Cinematography

by
Henry Siccardi
Head of Release-Printing, M-G-M Laboratory

IT HAS frequently been said that a Cinematographer is no better than the release-prints which carry his work to the theatres. The reverse of this statement may have received less publicity, but it is equally a fact that a release-print can be no better than the Cinematographer who makes the negative. Modern high-quality release-printing can bring out every bit of quality a Cinematagrapher puts into his negative—but it can never add qualities he forgets to put on the film.

The most desirable single quality is, of course, consistency in the photographic treatment of the production. Consistency not only in exposure, but in every other phase of camerawork—lighting, diffusion, and so an. It is obviously impossible, in making a production consisting of many hundreds of individual scenes photographed under diverse conditions over a period of weeks, ta maintain such ideally perfect exposure that the entire production will go through the printers on one setting of the printer-light. If that were possible, we would probably have no need for printer-light adjustments! None the less, the greater evenness in the negative exposures, the easier we find it to turn out consistently good release-prints.

However, uniformity of lighting and diffusion are of more practical impartance in getting first-class release-prints. Changes in lighting between one sequence and the next are often necessary for dramatic reasons. No one can find fault with such changes. But changes in lighting between dramatically similar sequences, or abave all, between scene and scene within the sequence, are indefensible. Such changes are first of all illogical and dramatically disturbing: and from aur viewpoint, they are bad because they alter the key and the contrast af our picture. I recently saw a picture in which there were several very nicely-photographed low-key sequences. Intercut with the longer shots of these sequences were many closeups in which an entirely different style of lighting was used: where, in the long-shots, the key was low, with relatively little light on the walls and background, in the closer angles the background was brilliantly lit. Those close shots stood out like a sore thumb—and I imagine the release-print crew had a terrible time trying to make the sequence even tolerably pleasing.

Such obvious errors are nat, of course, cammon, for good Cinematographers naturally strive to avoid them; but many lesser errors of the same general type come ta natice almast daily. Far instance, there is the common mistake of using a definite source-lighting for the establishing shats of a sequence—and then virtually ignoring it in the more intimate angles. It is all taa easy ta do this when the making of a sequence is spread over several days; but in the laboratary we have ta deal with the assembled sequence as a unit—and these little differences don't improve our work at all. The different scenes may all be lit in the same key, but the altered lightings bring changes in contrast and general quality which are very hard to cope with.

A whole volume could be written about moving-camera shats. They give us almost as much trouble as they give the camera crew, for unless the Cinematographer has a chance to make them perfectly—with plenty af time for getting even lighting and ample rehearsal—they give us bewildering changes in lighting, in key, and in contrast, all within a single scene, cavering only a few feet af film. But the less said about these shots, the better, for I realize that they are a thorn in the Cameraman's flesh no less than in ours, and the camera crews are doing everything in their power to make such shats (when they must make them) as perfect as circumstances allow.

Diffusion might nat seem, at first thought, a matter of much concern ta the laboratory, but it is. Most diffusing media tend ta grey the image, as well as to diffuse it; and this greying is proportional to the strength of the diffusion. Quite aside from this, diffusion tends ta alter the contrast of a scene, as well as changing the general photographic quality. It must be evident, therefore, that the laboratory must have a very definite interest in diffusion, and especially in maintaining more consistency in the use of diffusion. A long-shot, with little ar na diffusion, and a closeup with heavy diffusion, even though well-matched as to key and lighting, offer twa very different problems in printing. To put it bluntly, unless the Cinematagrapher follows a consistent scheme of diffusion, no laboratary an earth can avoid giving him spatty-looking release-prints. Coping with inconsistent diffusion between scene and scene and sequence and sequence is one of the most difficult problems encountered in all release-print laboratories.

Modern release-printing is definitely a scientifically controlled operatian, quite different from the unscientific methods af a few years aga. In the Metro-Goldwyn-Mayer Laboratary, we make all prints for American release, and some foreign master-prints, right within the studio. Our

(Continued on Page 384)

Shooting Color in the Air

by
Ray Fernstrom, A.S.C.

ELEVEN years ago while flying with Bernt Balchen over Spitzbergen searching for the lost Amundsen-Ellsworth Polar Expedition, our planes travelled over miles of what to a cinematographer is paradise, unphotographed territory. We succeeded in shooting from the air for the first time the eastern coast of this ice-locked northernmost island. The details of these flights were reported in the "American Cinematographer" of September 1925.

At that time no mention was mode of the loss felt at not being able to reproduce the myriad colors reflected from the rugged ice and snow-capped rocky peaks. Nevertheless, an ambition was born to some doy photograph an air film in color.

Five years later, the first thrill of seeing a color effort on the screen came my way, when with John W. Boyle, A.S.C., a series of colored travelogues were made in the Scandinavian countries. Further satisfaction came last year when Technicolor allowed me to take the first of the new three-color cameras to Europe. On that trip we covered France, Belgium, Holland, Switzerland, England, Ireland and part of Germany in our itinerary gathering material for four pictures.

Finally, this year, the dream of years wos realized when Mr. Dunning of Dunning Process, Hollywood, granted me the privilege of shooting "Wings Over the Golden Gate" in his color process. Using only the regular black and white negative in a standard Mitchell camera, no other mounting was required than those in general use on camera planes. This made low and high tilts possible with ease, and since four-hundred-foot magazines could be utilized the pilots had no objectionable air drag to contend with.

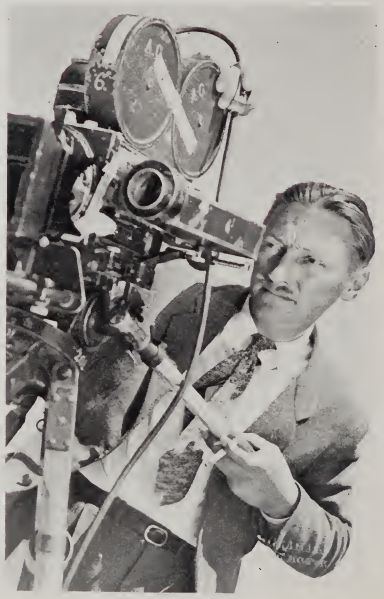
In the preliminary tests some simple rules made themselves immediately apparent, that may be helpful to others, whether for professional use or miniature cameras.

Backlighting proved tricky on such ground subjects as buildings, washing out the color contrasts as well as good detail. On planes in the air when their colors proved too glaring it served the purpose, subduing them excellently. Bearing these two points in mind it can be readily understood how a red plane was toned down to give the bright green below a chance when shot with backlight. From the air green fields look their greenest and brightest with back or back cross light, in this writer's opinion. In the matter of clouds, back cross light shines at its best as it does with black and white in the air. Imagine a squadron of planes in formation, flying over a sea of those big whipped-cream billowing clouds backed by an azure blue sky! Before long, such scenes will show color at its spectacular peak, for it is common knowledge that color lends also a satisfying illusion of plastic roundness and depth that has as yet to be enjoyed in black and white, in fact it is the nearest approoch to stereoscopic values. With the sun directly above us all the world below our cameras seemed to flatten out beyond any reason to photograph it, but at such times the top light was tried out on other planes in the air, that maneuvered from alongside of the camera ship into vertical banks toward the camera, then diving and pulling out below us. Here the flatness below tended to eliminate any distraction from the plane being photographed.

Front cross light appears the ideal choice for general color shooting in the air. The unusual in lighting effects present themselves just at sunset when the light comes from below as when flying at fairly high altitudes. To anyone who loves the unusual, sunset shots of companion planes against clouds lighted from below by the setting sun are a revelation in beauty. Watch the lighting on clouds FACING the next bright sunset you witness and a splendid example of the possibilities will surely present itself to the reader. A scene similar to this appeared in a

(Continued on Page 388)

Ray Fernstrom, A.S.C.



PHOTOGRAPHY of the MONTH

"THE BLACK ROOM" (Universal)

Al Seigler, A.S.C.: Directing Cinematographer

Hollywood Reporter (July 17, 1935): "Al Seigler's photography is top-notch."

Daily Variety (July 17, 1935): "Photography of Al Seigler is very good."

"WE'RE IN THE MONEY" (Warners)

Arthur Todd, A.S.C.: Directing Cinematographer

Motion Picture Daily (July 18, 1935): "Arthur Todd's photography is good."

Daily Variety (July 17, 1935): "There's some excellent camera work by Arthur Todd."

"MANHATTAN MOON" (Universal)

Charles Stumar, A.S.C.: Directing Cinematographer

Hollywood Reparter July 17, 1935): "The late Charles Stumar's photography is one of the few good features af the production."

The Film Daily (July 22, 1935): "Photography, good."

"SMART GIRL" (Paramount)

John Mescall, A.S.C.: Directing Cinematographer

Daily Variety (July 18, 1935): "Photography is good."

The Film Daily (July 27, 1935): "Photography, A-1."

"WESTWARD HO" (Republic)

Archie Stout, A.S.C.: Directing Cinematographer

Hallwood Reporter (July 18, 1935): "Photagraphy by Archie Stout being especially noteworthy, not only far the great actian shots, but for some excellent compositions."

Daily Variety (July 18, 1935): "First line credit must go to Archie Stout for his magnificent photography."

Mation Picture Daily (July 20, 1935): "The photography of Archie Stout is outstanding."

The Film Daily (July 30, 1935): "Photography, Fine."

"THE OLD HOMESTEAD" (Liberty)

Harry Neumann, A.S.C.: Directing Cinematagrapher

Daily Variety (July 20, 1935): "Harry Neumann sustains the high quality with his fine photography."

"STEAMBOAT ROUND THE BEND" (20th Century-Fox)

Geoerge Schneiderman, A.S.C.: Directing Cinematagrapher

Hollywood Reporter (July 22, 1935): "Photography inside and out speaks volumes far the craftsmanship of George Schneiderman."

Daily Variety (July 22, 1935): "Photography of George Schneiderman is excellent."

Motion Picture Daily (July 23, 1935): "George Schneiderman's photography is a pictorial delight."

The Film Daily (July 25, 1935): "Photography, Fine."

"BONNIE SCOTLAND" (Roach-MGM)

Art Lloyd, Walter Lundin, A.S.C.: Directing Cinematographers

Hallywood Reporter (July 22, 1935): "Photography by the two cameramen is good."

Daily Variety (July 22, 1935): "Camera has been well handled by Art Lloyd and Walter Lundin."

Motion Picture Daily (July 23, 1935): "Art Lloyd and Walter Lundin's photography is good."

"JALNA" (Radio)

Edward Cronjager, A.S.C.: Directing Cinematagrapher

Hollywood Reparter (July 23, 1935): "Cronjager's photography is consistently beautiful throughout the picture."

Daily Variety (July 23, 1935): "Edward Cronjager has used his camera to fine advantage."

The Film Daily (July 26, 1935): "Photography, A-1."

"BRIGHT LIGHTS" (Warners)

Sid Hickox, A.S.C.: Directing Cinematographer

Hallywood Reporter (July 24, 1935): "Photography of Sid Hickox is ample throughout."

Daily Variety (July 24, 1935): "Sid Hickox has photographed the production nicely."

The Film Daily (July 27, 1935): "Photography, Fine."

"CHEERS OF THE CROWD" (Monogram)

Milton Krasner and Harry Neumann, A.S.C.: Directing Cinematographers

Daily Variety (July 24, 1935): "Photography by Milton Krasner and Harry Neumann is standard."

The Film Daily (August 6, 1935): "Photography, Okay."

"HOT TIP" (Radio)

Jack MacKenzie, A.S.C.: Directing Cinematographer

Hollywood Reporter (July 25, 1935): "The photography is very good."

Daily Variety (August 9, 1935): "Credit should go to Jack MacKenzie for his photography."

"HOP-ALONG CASSIDY" (Paramount)

Archie Stout, A.S.C.: Directing Cinematographer

Hollywood Reporter (July 26, 1935): "The high Sierras country has never been photographed so magnificently."

Daily Variety (July 26, 1935): "Carmeraman Archie Stout having turned in a class job of photography."

The Film Daily (July 30, 1935): "Photography, Fine."

"EVERY NIGHT AT EIGHT" (Paramount)

James Van Trees, A.S.C.: Directing Cinematographer

Hollywood Reporter (July 26, 1935): "Van Trees' photagraphy is excellent."

Daily Variety (July 26, 1935): "Photography of James Van Trees, excellent."

The Film Daily (July 30, 1935): "Photography, A-1."

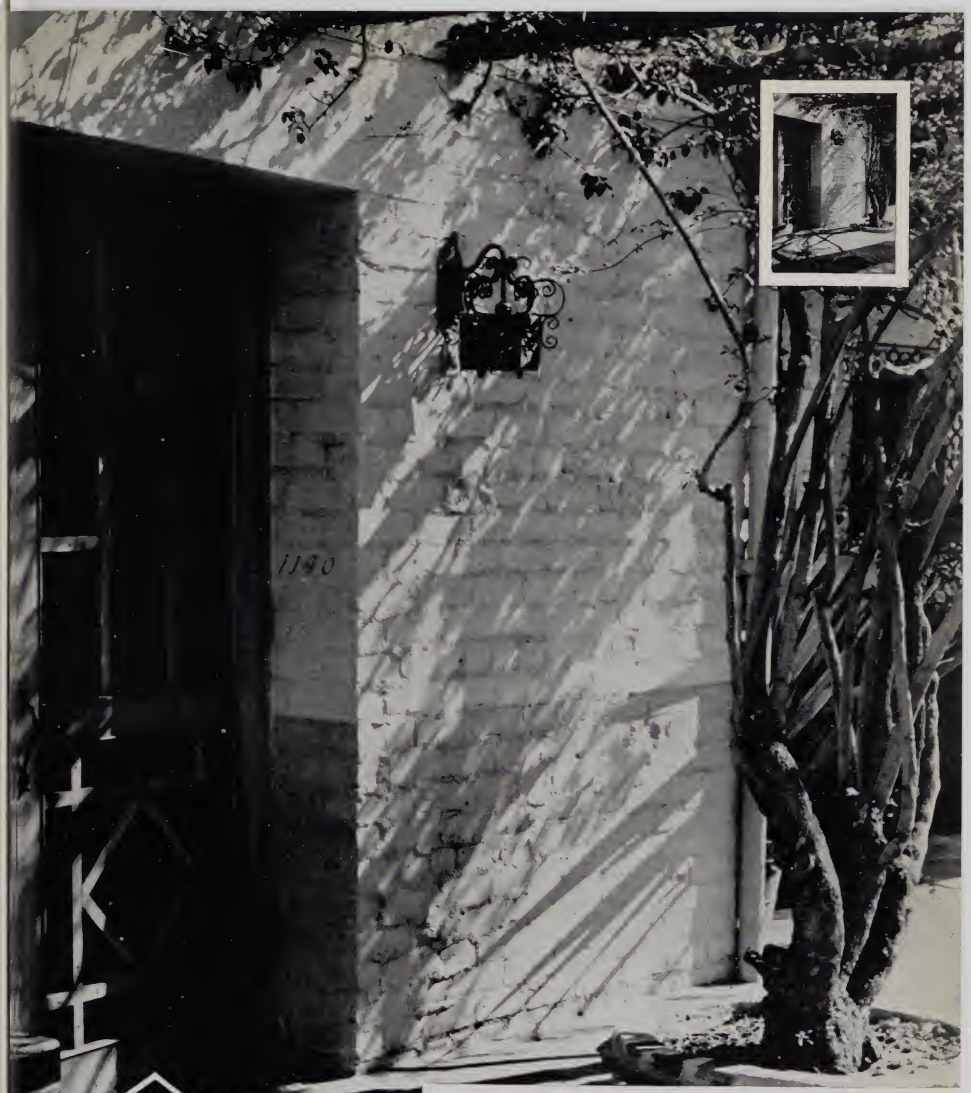
"PURSUIT" (MGM)

Charles Clarke and Sidney Wagner, A.S.C.: Directing Cinematographers

Daily Variety (July 27, 1935): "Charles Clarke and Sidney Wagner's photography is excellent."

Hollywood Reporter (July 27, 1935): "Photography gives class to picture."

(Continued on Page 384)



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PHOTOGRAPHY OF THE MONTH

(Continued from Page 382)

"LITTLE BIG SHOT" (Warners)
Tony Gaudio, A.S.C.: Directing Cinematographer
Hollywood Reporter (July 27, 1935): "Tony Gaudio's photography continues tops."
Daily Variety (July 27, 1935): "Tony Gaudio does his usual excellent camera work."

"CHINA SEAS" (MGM)
Roy June, A.S.C.: Directing Cinematographer
The Film Daily (July 25, 1935): "Photography, A-1."
Motion Picture Daily (July 23, 1935): "The photography by Ray June does much for the picture's mood."

"WITHOUT REGRET" (Poromount)
William C. Mellor, A.S.C.: Directing Cinematographer
The Hollywood Reporter (July 30, 1935): "Mellor's photography is uniformly up to standard."
Daily Variety (July 30, 1935): "Photography of William Mellor is uniformly good."

"SHE GETS HER MAN" (Universol)
Norbert Brodine, A.S.C.: Directing Cinematographer
Hollywood Reporter (July 31, 1935): "Narbert Brodine's camera work does plenty of good for the picture and cast."
Daily Variety (July 31, 1935): "Norbert Brodine's photography is capable."
The Film Daily (August 5, 1935): "Photography, A-1."

"THE GOOSE AND THE GANDER" (Warners)
Sid Hickox, A.S.C.: Directing Cinematographer
Hollywood Reporter (July 31, 1935): "Sid Hickox's photgraphy is above program standards."
Daily Variety (July 31, 1935): "Photography of Sid Hickox, eye-filling."

"THE CRUSADES" (Paramount)
Victor Milner, A.S.C.: Directing Cinematographer
Hollywood Reporter (August 1, 1935): "Milner's photagraphy is magnificent."
Daily Variety (August 1, 1935): "Victor Milner's photography is a thing of beauty in composition and movement and dramatic lensing, ronging from eloquent closeup to the sweep of covolry charge and the dark terrors of the war machines."
The Film Doily (August 5, 1935): "Photography, Best."

"DANTE'S INFERNO" (Fox)
Rudolph Mote, A.S.C.: Directing Cinematogropher
Daily Variety (August 1, 1935): "Photography especially commendable."
The Film Daily (August 1, 1935): "Photography, Excellent."

"ALICE ADAMS" (Radio)
Robert DeGrosse, A.S.C.: Directing Cinematographer
Hollywood Reporter (August 3, 1935): "Also a great word that meons beautiful to the photogrophy by Robert DeGrasse."
Doily Variety (August 3, 1935): "Robert DeGrasse has handled his camera most effectively."

"SHE MARRIED HER BOSS" (Columbia)
Leon Shomroy, A.S.C.: Directing Cinematographer
Hollywood Reporter (August 6, 1935): "Leon Shamroy delivers top-hole photography."
Daily Variety (August 6, 1935): "Camera is distinctively handled by Leon Shamroy."

"TOP HAT" (Radio)
David Abel, A.S.C.: Directing Cinematogrpher
Hollywood Reporter (August 13, 1935): "Abel's photography contributes plentifully to making this an A-1 example of screen musical."

"WAY DOWN EAST" (20th Century-Fox)
Ernest Polmer, A.S.C.: Directing Cinematographer
Hollywood Reporter (August 14, 1935): "Neither is it possible to overstress the beauty of Ernest Palmer's photography which makes the picture, with its succession of lovely farm scenes, o joy to behold."
Daily Variety (August 14, 1935): "Photography by Ernest Palmer is exceptionally good."

"HERE COMES COOKIE" (Paramount)
Gilbert Worrenton, A.S.C.: Directing Cinematographer
Daily Variety (August 14, 1935): "Gilbert Worrenton's photography is deserving of creditable mention."

"THE GAY DECEPTION" (20th Century-Fox)
Joseph Volentine, A.S.C.: Directing Cinematographer
Hollywood Reporter (August 15, 1935): "Valentine's photography does things for everyone in the cast that should make them beg for stills. His work is superb throughout."
Daily Variety (August 15, 1935): "Photagraphy of Joseph Volentine is workmanlike throughout."

"FORBIDDEN HEAVEN" (Republic)
Milton Krosner, A.S.C.: Directing Cinematographer.
Hollywood Reparter (August 15, 1935): "Allowing Milton Krasner scope for some very effective photographic effects."
Daily Variety (August 15, 1935): "Photography, Okay."

Release-Prints Reflect Cinematography

(Continued from Page 379)

work begins immediately the cutters, scorers and re-recarders have completed their work, and turned over to us the assembled sound and picture negatives.

The first step is of course to prepare a complete printing-chart of the production, scene by scene, accompanied by a chart enumerating each scene and its action. The correct printing-lights for each scene are determined by the most modern densitometric methods, checked against the judgment of an experienced timer. A speciol test section is then spliced at the beginning of each reel. This test section includes a standard sensitometric strip and a few inches of a standard picture-negative (a closeup): every print made from that reel of negative must check up a perfect match against standard prints from the master negative of this test-strip.

At this point, the First Answer Print is made. It goes through every step of the normal release-printing process except that it is made on the older type Bell & Howell printers. The light-adjustments of these printers, however, are identical with the matted light-changes of the newer automatic production-printers. This print is then submitted to the criticism af the camera and sound department experts, as well as to that of the laboratory-heads. Any modifications they may suggest in the printing of either sound or picture are then embodied in a Second Answer Print, which is subjected to the same close scrutiny. If necessary, a third, and even at times a fourth, Answer Print may be made, until all departments agree that perfection has been reached. Then the Master Print is made as a standard to which every release-print must conform.

At this point, the mattes for the Bell


Congratulations to
Ray Rennahan, Chief Cinematographer
for Technicolor, on his splendid work
in photographing "Becky Sharp"
NATIONAL CARBON COMPANY, INC., CLEVELAND, OHIO

& Howell Automatic Production Printers are cut, conforming in every particular to the light-changes charted for the Master.

Then the routine of release - print making commences. The negative is placed in the Automatic Printers, where it is completely enclosed, protected from dust and harm, and never removed until the last print is made. In these printers, of course, the negative simply shuttles back and forth from one reel to another, printing in both directions. Once threaded, the negative is untouched until the printing operations are completed.

From the printing-room, each roll of positive goes at once to the developing-machines. These machines are of the turbulence-agitation type, in which the film moves on a course which keeps its width parallel to the length of the tank, rather than at right angles thereto; a spray of fresh developer is constantly directed at the face of the emulsion, eliminating the directional streaks and "bleeding" often seen in machine-developed film.

Immediately the print comes off the developing-machine, the test-section is matched against a standard master-print of the same test negative. If there is the slightest variation, the matter is at once reported, and the trouble run down.

The next stage is, of course, inspection. The projection in all of the inspection-rooms, the laboratory's master projection-room, and the projection-room in which the prints are inspected by the camera, sound, and other executives, is absolutely standardized. The illumination-level on these screens is constantly maintained in accordance with standards established by a nation-wide survey of theatre screens: if a print passes our inspection, it will be satisfactory on any screen in the country.

A DISCIPLE OF ELIMINATION

(Continued from Page 378)

ographic; a diligent and pains-taking practitianer of his profession. Yet he is far from stolid or reactianary. He keenly appreciates the task of retaining audience interest over extended periods. He avoids drab dullness of manatanaus mood as a pestilence. Any face living becomes tiresome unless frequently altered in lighting effect. He changes the key of his faces as rapidly as the moods of the scenes vary. And, to him, the simpler a face is lighted, the better.

His current opus "Here's to Romance" is an adequate vehicle of expression for his talents. He had two notable names to film. Neither had ever been lensed in a studio before. They were of the operatic warld, Madame Schumann-Heink and Nino Martini. He suggested that the usual tests be made by ather hands, that he might be freer to study the screened features; a constant policy of his, by the way.

Both were unversed in studio practice, so O'Connell visited their make-up quarters in advance af shooting and calmly went about securing and instilling mutual confidence between cinematographer and star. When cameras went into action, there was no uncertainty, no worries, and smooth performances both sides af the lens were the result.

Schumann-Heink, he reveals, is marvelous to wark with. She is so much herself, sa imbued with naturalness that her vibrant personality fairly impresses itself on the negative. He used na make-up with her, photagraphing her just as she walked in from the street. Her hair, not toa white, is just right for cinematagraphic purposes.

With Martini, a specific problem appeared. Filming of his superb voice in song was the prime consideration. The strain of singing caused his face to become tense. Minute particles of moisture appeared and gathered in his eyes, very noticeable in close-ups. And here, O'Connell's lang devation to elimination of the objectionable stood him in good stead. Martini's unabridged charm is captured on picture as well as in saund.

As this is written, wires are bringing first news of Will Rogers' untimely death. O'Connell photographed "In Old Kentucky," Rogers' last picture to be released.

O'Connell is of ideal temperament for his high position as ace cinematographer. For him, each day brings forth its quota of interesting problems to be salved — carefully, thoughtfully, calmly and deliberately. He shows rare talent in adapting his creative arts to prevailing conditions. He is very much the opportunist — draining the last drap of screen appeal from sketchy comedy or deep drama. His photagraphy — the technical accuracy always being granted —is ever in keeping with his subject; it never reaches out to slap you in the face.

And if his finished works reveal to you a feeling of subtle, unobtrusive perfection, as they invariably do, it is because of his insatiable quest for objectionable traits to be eliminated. Cine-

motography is a simple science, he feels, once the mechonics of the prafession become second nature. One merely eliminotes the bad things, leaving oll the good things. Then ane photogrophs them—and one has a good picture!

Practical Angles on the Use of Pola-Screens

(Continued from Page 375)

filter, but which can olmast always be mode mare pleasingly by a palorizing screen.

Other uses far the screens will unquestionobly be found as they came inta more general use. Their usefulness in the field af special-effects camerowork, far exomple, con easily be imagined. In the meontime, they are certainly a voluable tool if used understandingly. They are easy ta use; the whale story af haw ta use pala-screens may be summed up in the simple odmonitians: always 2 stops larger apening, regardless of the positian of the screen; for skies, shoot at right ongles to the direction of the sun; to remove reflections, shoot at 32° to the reflecting surfoce; dan't try ta remave oll the reflections fram curved surfaces—it con't be dane; and remember the slogon af the fomous amateur camero-moker: "What you see — you get!"

Shooting Color in the Air

(Continued from Page 380)

Fitz Patrick Travel Talk an Switzerland in Technicalar. In this case the writer used Mt. Jungfrau with its mantle af snaw against a deep blue sky.

A remarkable example will answer thase readers wha ask, "Why color in the air?" In the air film af San Francisca referred ta, thase great new bridges painted in red lead spanning bath the bay and Golden Gate recarded brightly even fram an altitude af twelve thausand feet.

In the shaating af calar, praper exposure becames the chief care, but with praper meters this warry saan disappears even in the air. White becames a "calar" that attracts almast as pawerfully as red when spatted in blues, brawns ar greens. Far example, the beautiful white marble Legion af Hanar by the Galden Gate, in its setting af smaath green lawns surraunded by the blue water af the Pacific. It is a scene such as this that makes shaating calor in the air a keen new pleasure ta the phatagrapher wha laves his wark. Just think! the amateur, taa, naw has this medium in the new films an the market. That na air shats have yet appeared thus made is a surprise.

In shaating my first air picture in calar the mast striking scene praved ta be that af an airpart. Here were checkerbaard arange and black squares cavering the raafs af a lang raw af hangars, ten ar mare planes an the ground af various calars, with three in the air belaw the camera. The runways an the field were brawn, bardered by green grass. Running a clase secand was a scene af Stanfard University which as mast af yau knaw is made up af red brick structures. Here the third-dimensianal illusian was **very** pranaunced. Whenever a plane flies between the camera and a setting an the graund such as this, this illusian is perfect.

This is an age af speed and pragressian. Even railroad trains capable af 110 miles per haur have been develaped. Planes have circled the glabe in a little aver a week and they have crassed aur cantinent in ten haurs. All other industries have kept step, sa it is anly natural that we shauld expect great new achievements in matian pictures.

Since we have naw accamplished a shart air picture in practical calar, and have had many calor pictures an the graund, isn't it abaut time that **features** made use af **color in the air?**

LOOKING BACK 10 YEARS

● "Black Cyclone," directed by Fred W. Jackman and photographed by Floyd Jackman, both A.S.C. members, has taken the critics by storm in its initial exhibitions at the Capitol Theatre, New York, and at the Rialto, Los Angeles.

● Harry A. Fischbeck, A.S.C., is with Famous Players-Lasky at the Paramount Long Island studio, photographing D. W. Griffith's production of "Sally of the Sawdust."

● Charles Rosher, A.S.C., has concluded the photography on "Little Annie Rooney" and is ready for preparations on the next Mary Pickford feature

● Ernest Palmer, A.S.C., has finished shooting "East Lynne," an Emmett Flynn production for Fox.

● Victor Milner, A.S.C., who has just completed the filming of R. A. Walsh's production of "The Wanderer" for Famous Players-Lasky, has signed a contract for a period of two years with Paramount.

● J. D. Jennings, A.S.C., is filming Mrs. Rudolph Valentino's (Nita Naldi) first production. Thomas Buckingham is directing.

● Dan Clark, A.S.C., is all primed to jump back into his cinematographic harness again, now that Tom Mix has returned from his triumphant tour of Europe.

● Norbert F. Brodin, A.S.C., has at last returned from location in Canada where he was quartered for so long on location on Frank Lloyd's latest production, "Winds of Chance."

● Ernest Haller, A.S.C.. is photographing "High and Handsome," a Garson production starring Maurice Flynn.

● Tony Gaudio, A.S.C., is still busy on the cinematography of "Graustark," the latest Joseph M. Schenck production starring Norma Talmadge.

● John Arnold, A.S.C., is filming King Vidor's production, "The Big Parade," at the Metro-Goldwyn-Mayer studios.

● John W. Boyle, A.S.C., will be chief cinematographer on the First National special feature, "Viennese Medley," which will go into production under the personal supervision of June Mathis.

DAN CLARK MARRIES

Dan Clark, A.S.C., for these many years a single man, has finally joined the ranks of the benedicts.

Dan on July 3rd married Miss Mary Dahl at Caliente, Mexico. The couple kept the secret of their marriage until last week when the groom could no longer resist the temptation of passing out cigars.

Dan Clark, it will be recalled, is one of the ace cameramen of the Hollywood studios. He photographed all of the Tom Mix pictures and recently has been directing photography for various Fox releases. His latest picture is "This Is The Life" featuring Jane Withers, which will soon be released.

INBUILT DIFFUSION FEATURES NEW LAMP

Inherent diffusion and a built-in dimming rheostat feature a new general lighting unit developed by A. C. Jenking, of Hollywood. The lamp is of the reflector type, employing standard PS 1,000 or 2,000 watt globes to which a special reflecting area has been applied. This reflecting surface consists of a mirrorlike aluminum deposit which is stated by the inventor to be of the highest reflective value, and to withstand wear, heat, and virtually all corrosive action; it is coated on the front side of the globe, and reflects the forward rays of the filament back upon the lamp's main reflector.

This reflector is non-specular, and is also an electrolytic deposit of aluminum. According to the inventor, its surface is microscopically faceted by means of this plating action, and breaks up the light-rays into a completely diffused beam, eliminating the need for conventional diffusers. Due to the extreme diffusion thus produced, the lamp will not produce a hard shadow at any time. The globe and the reflectors are fixed, and the beam does not focus as in conventional units.

The rheostat is mounted at the rear of the lamp house, behind the reflector. It is controlled by a knob located centrally on the back of the lamp. The new lights are being manufactured under the name "Vitachrome."

PHOTOGRAPHIC SLIDE-RULE

John L. Russell, Jr., A.S.C., has developed a slide rule which greatly simplifies the computation of photographic variables such as filter-factors, shutter-apertures, still-camera exposures and depth of focus. On one face of the rule is a depth of focus calculator, by which the focal depth of any lens from 25mm to 200mm may be instantly determined for any focal setting and aperture. Lenses of longer focus can also be accommodated by a simple additional process.

The opposite face of the rule provides means for determining the correct exposure for any filter on Eastman Type 2 or SuperSensitive, DuPont Regular, Special or Superior, and Agfa Super-Pan films. By the same device, the correct lens-aperture for any change in shutter-opening or camera-speed may be quickly determined, motion picture camera exposures may be translated into still-camera exposures, and all exposure-factors in still photography may be determined exactly as accurately as are cine factors.

You'll Want Color . . .

when you see the new Kodachrome Film exposed in a

FILMO Camera

John Arnold, President of the American Society of Cinematographers and head of the M. G. M. camera department, discussing his Filmo 70-D camera with Grace Moore, who also is a Filmo owner.

All honors to Kodachrome! And to enjoy the full possibilities of this wonderful new three-color process, use it in a Filmo. Filmo has the scientific design plus precise construction essential to fine color results. Its Taylor-Hobson lens is noted for sharp definition and ability to focus all colors at the same plane. The 216° shutter opening of Filmo 70 Cameras admits 20% more light than other shutters—an important advantage. You'll surely want color when you see it exposed in a Filmo!

And Filmo is a versatile camera—giving you any set-up you want for any picture you want—indoors, outdoors, at the races, at the tea party, on tour, at the beach and in the backyard with the kids, in full color or in black and white.

Go to your dealer's today and take a real look at the finest 16 mm. movie camera you can buy—made by Bell & Howell, world's foremost manufacturer of studio cameras and equipment used by the major film producers.

Filmo 70-D, master of all 16 mm. movie cameras—three-lens turret, seven film speeds, variable viewfinder. Price, $202.50 and up.

Filmo 121—feather-weight, automatic magazine loading, invitingly small. The most "carryable" 16 mm. camera in moviedom. Price, $67.50.

BELL & HOWELL **FILMO** *Personal Movie Cameras and Projectors*

Bell & Howell Company, 1848 Larchmont Ave., Chicago; New York; Hollywood; London (B & H Co., Ltd.), *Established 1907*

AMATEUR MOVIES

this issue

Home Negative and Positive Laboratory

Let's Talk About Shutters

Animation for the Amateur

Breaking Cine Traditions

. . . and other features

SEPTEMBER, 1935

PRICE 25c

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AMATEUR MOVIE SECTION

Contents . . .

Next Month . . .

● Under the title "Say it with Added Scenes," Wm. Stull, A.S.C., next month will tell you what to do with a lot of those miscellaneous shots you made during the summer, ond perhaps even before that.

● "Tricks with o Mirror" will also interest you. You will be surprised just how mony gags you can do cinematogrophicolly with the common ordinory every doy mirror.

PROFESSIONAL Criticism of the Amateur picture is a part of the service offered by the AMERICAN CINEMATOGRAPHER. Many are not aware of this. Hundreds of pictures have been reviewed this past year by members of the American Society of Cinematographers for the Amateur.

Negative-Positive Home Laboratory Work

by
Charles E. Keevil

MORE and more, the serious worker in 16mm film is turning to the negative - positive process in preference to the reversal process because of the many advantages it offers; such as, an unlimited number of copies of equal quality, wide latitude in exposure for special effects, the possibility of introducing mony trick effects in the printer, and o negative to preserve. The one objection to this process in the past, graininess, has been largely eliminoted by the film manufacturers who now offer 16mm negative stock which will produce pictures of excellent quality if handled correctly. It is the purpose of this article to give the beginner sufficient information so that he can do his own laboratory work, as many serious workers prefer, or to understand the process well enough to use it successfully when the work is done by o commercial laboratory.

First, let us consider the equipment needed to develop and print 16mm film. Some type of drum or rack with tanks for developing the film, a drying drum, a printer and a dark room lamp complete the necessary equipment outside of chemicals—and a scale to weigh them if the worker wants to compound his own. Many of these items can be made by the worker, so the cash outlay need not be great unless it is desired to process a large amount of film.

The first item, the developing drum or rack, together with their tanks is one of the most important items. There are several special reel and tank outfits on the market which can be bought reasonably and which will do the work nicely altho they do not permit ready inspection of the film during development. They also require careful handling of the film in transferring to the drying drum. The writer believes the beginner will find the drum system the easiest to handle safely and one thot can be easily made at home. The accompanying photograph shows such a drum together with its tank. The drum can be made of wood of such size as the worker may desire (the one shown holds 50 feet of film) with wooden dowel pins set in three of the bars to space the turns of film. The whole is well painted with a black waterproof enamel. The tank in which the drum revolves is best made of stainless steel with welded joints, altho other metals (such as brass or galvanized iron) with soldered joints can be used if the whole tank is given several coats of good waterproof enamel. The enamel should be inspected frequently and touched up when it becomes chipped. Three tanks will be required, one of which should have a tube for attaching a hose from the water faucet for washing the film.

The drying drum can be a skeleton affair supported so it can be revolved in winding the wet film onto it from the developing drum. It can be only a four bar "drum" if simplicity of construction is desired.

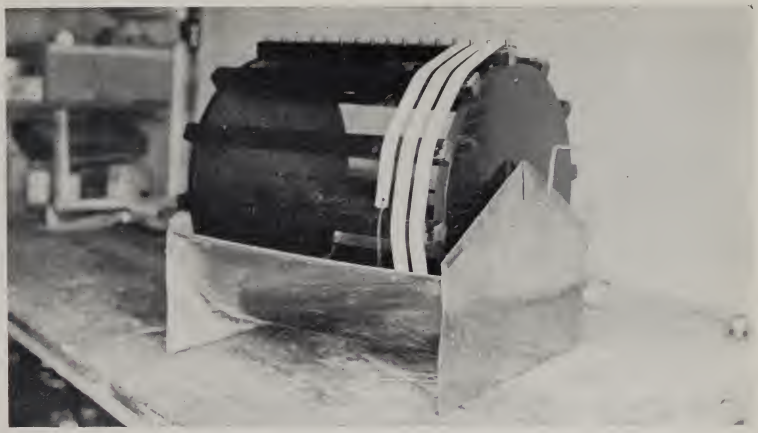
The printer is the most elaborate piece of equipment needed but even it can be built from a small projector or camera similar to the one described in the June 1935 issue of the American Cinematographer. Of course, the details will have to be altered to fit the type of projector or camera being used; the moin things to secure being good contact between the two films, uniform speed of the motor drive and a means of changing the intensity of the printing light. If possible, it is desirable to be able to watch the picture being printed at the aperture so as to change the printing light as the scene changes. If the camera or projector being used will not permit this, the negative film can be notched on one edge at the scene changes and a lever put on the printer to ride on the edge of the negative film—when a notch comes through, the lever will drop slightly and can be arranged to give a signal for the light change. Commercial printers automatically make the light change when the notch passes the lever, but that will complicate things too much for the home constructor unless he is well equipped with tools. If the printer is run at a speed of about 8 frames per second (half camera speed) the operator can make the light changes by watching the picture in the aperture or from the signal. If one is well supplied with cosh, there are several good 16mm printers on the morket.

A dark-room lamp with both red and green safelights, chemicals, scale (if used), bottles for the storing of solutions, and a small viscose sponge complete the equipment. Half-gallon fruit jars of the glass top variety are excellent for storing developer and hypo as the rubber ring seals them air-tight. The viscose sponge should be cut in half, so as to have two thin pieces for removing excess water from the film when it is wound onto the drying drum.

Making the Negative

All the large film manufacturers make 16mm negative altho they don't seem to advertise the fact and many do not know about them. Eastman, Agfa and Gaevert moke a regular speed panchromatic negative which is about ½ stop faster than regular reversal panchromatic film while Du Pont makes both a regular and o "Special" or supersensitive panchromatic negative, the supersensitive being about 1 stop faster than the regular or 1 to 1½ stop faster than regular panchromatic reversal. A good exposure meter is a big help—if a Weston meter is used, a film speed factor of 16 for the regular negative and 24 for the Spceial is about right for daylight work. All these films come on daylight-loading spools and are loaded in the camera in the same manner as the reversal film—a difference in the film will be noted as the non-halation coating on the negative is much lighter in color, not the heavy black as found on reversal film. Loading of the camera should be done carefully, especially with the supersensitive film, to avoid edge fog.

In order to gain familiarity with the equipment, the



Home Made Developing Drum

beginner may want to shoot some positive stock in the camera and develop it before attempting the panchromatic negatives. Positive stock can be handled in quite a bright red light so that the worker can see what he is doing while the ponchromatic film must be handled in a dim green light—or better still, without any light. A fairly good negative can be made on positive stock, except for color rendering, if it is given a soft development. Exposure for this film should be about the same as for regular panchromatic reversol in good light—a little more when the light is poor.

Developing the Negative

When the film has been exposed and ready for development, the lights ore extinguished except the proper safe light ond one end of the film attached to the drum with a thumb tack. The drum is revolved and the film wound between the spocing pins (emulsion side out, of course) until the drum is full or the end is reached. The end of the film is then fastened with a rubber band to the drum —the rubber band will take up the slack (film expands when wet), if the film is revolved in the developer in the same direction as when the film is wound on the drum.

The developer is then poured into the tonk and the drum revolved slowly so the film dips into the solution—only a small quantity of developer is needed with this system of development. The beginner should stick to a stondard developer such as Eastman's D-76 which was developed especially for fine grain development of motion picture film. This formula developer can be bought ready to dissolve in water if it isn't desired to compound it ond it will keep for months if bottled in on air-tight fruit jar or similar container when not in use. The formula is given below for those who want to mix their own: ....

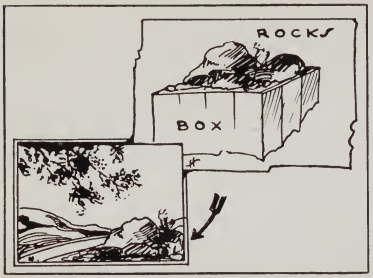
Metol	60 grains
Sodium Sulphite	7 ounces
Hydroquinone	150 grains
Borax	60 grains
Water	½ gallon

The regular ponchromatic negative films are capable of great contrast—too great unless development is watched. Lengthening development time increases contrast, shortening development time reduces contrast, other things being equal. By varying the length of development time a negative can be made to suit the worker's idea of contrast altho the shorter development times will give finer grained negatives. The writer likes about 7½ minutes with the regular and 9 minutes with the Special panchromatic negatives when the developer temperature is 68°. The worker will have to decide for himself what degree of contrast he likes ond olter his development time accordingly. After the film has been developing for obout 5 minutes, a green safe light can be brought up close to the film for examination, altho not much can be seen in the weak light. A straight time development is best, especially if a short test has been taken off the roll and developed before starting to do the whole roll. If thot is done, the whole development of the negative can be carried out in total darkness so that all danger of fog is eliminated.

When the development is complete, as determined by inspection or time, the film is transferred to the wash tank and revolved for a minute or two, then transferred to the hypo tank for fixing. Eastman's prepared acid fixing powder is quite satisfactory for this—one pound makes half a gallon of solution which will keep nicely in a jar when not in use. Revolve the film through the hypo until the silver bromide is completely dissolved away—after it visibly begins to disappear, the white lights can be turned on for the rest of the process. Complete fixing is desired, so do not rush the operation; again as long as it takes the film to visibly clear, is safe.

After fixing, the film is washed thoroughly by revolving it in the wash tank while water from a faucet is run into the tank with a rubber hose and allowed to overflow the tank. About 15 minutes of washing will be satisfactory, after which the film is run onto the drying drum. Loosen one end of the film on the developing drum and attach it to the drying drum. Wet the two pieces of viscose sponge and squeeze out as dry as possible. Place one piece of the sponge on each side of the film and revolve the drying drum so as to pull the wet film off the developing drum through the sponges and onto the drying drum. Press the sponges together firmly enough to wipe all surface moisture off the film—the hardener in

(Continued on Page 408)



ne pile of rocks shown in the lower left hand rner is the box of rocks above camouflaged th a bit of shrubbery.
.he branch hanging in from the upper left hand corner is being held by an assistant.

The Art Director In 16mm

by
J. Belmar Hall, Instructor
Department of Cinema, U.S.C.

FROM story to the screen, the art directar is closest to the involved methads af production. In 16mm, the cameraman is his own art director. Every scene is nat always a good scene, but he can make it so with very little effort. This may saund hard but the seemingly uninteresting shot can be very vital and dynamic in composition. In a moment the flat desert scene becomes alive with interest. The beautiful scenes in Eisenstein's "Starm Over Mexico," were nothing but the cameraman using the camera as the painter-artist uses his brushes and pigments, plus his head in seeing only what is essential in good composition.

Haw is this done? Instead of shooting the desert as sa much apen country with small vegetation, take some cactus and place it in the foregraund, and frame your shot so that it takes in everything but the praps that hold them in pasition. You have added the note of interest that makes it good balance, ar camposition.

You can take a small twig ar branch and let it fall into the frame line, so that it will lead the eye to the center interest. In action shats it is very important to have lines that will lead into the picture, this can be done by adding some abstract praps that never detract but force the eye to follow lines into main action.

If you happen to be at the beoch and everything is flat in the foreground, you can build your own pier or have a rock pile fit into the scene by adding a few sticks of wood or some rocks, so that they cut into the frame line and give the appearance of having been there for years. It is good to have food that will attract the gulls that migh be flying overhead, you have added the note of interest that makes good pictures.

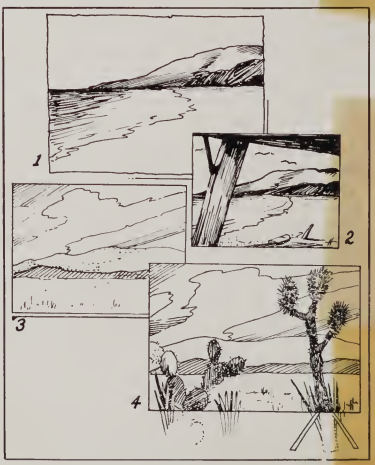
Always remember that adding samething to the composition will lend interest ta what a mament ago seemed stotic. It is well to remember that the camera lens has no brains, it is up to you to put them there. Alsa, that the camera is not frozen to any restrictions like the human body, but will see things at mare angles than mon has ever attempted with his eyes. Dan't be afraid to go to the top af a building, or ta shoot thru some high window. You can climb out on a strong limb and shoot the scene, or get down on the ground and shoot up to the scene, that will add interest.

Take some small praps and place them in your foreground, personal things that will build up the scene. If you were shooting your garden with the flowers and bushes showing along the path don't be afraid to put a watering pot, and some odd flowerpats strewn abaut. This will show that same living person had really planted your garden, and it adds that abstract note of human interest.

When shooting the children at play don't be afraid to scatter some toys on the ground, they do throw things about, and, as you pan inta them a Teddybear lying over on its side with a leg up in the air adds humor to the scene. A broken doll face dawn adds pathos, blocks thot might have been a castle are swept aside, throw a block and follow shat, you have action.

When shooting interior scenes it is good to look carefully at each item that comes into the scene, then place a bit of paper at each object and you will soon see that a lot af things can be removed without hurting the composition. This methad is used by the best interior decorotors

(Continued on Page 406)



Upper picture shows marine scene without anything in foreground to give perspective. In lower sketch you have the impression of pier. Lower picture shows desert scene, composition is added by using cacti as indicated.

Let's Talk About Shutters

by
L. Guy Wilky, A.S.C.

AMATEUR filmers aren't so very unlike their professional fellows. On both sides of the studio wall, you'll find camera-users discussing their equipment and its possible improvement. Among the amateurs, a great deal has been said about film, lenses, tripods, exposure-meters, and such things: but one of the most important features of all has almost completely escaped attention.

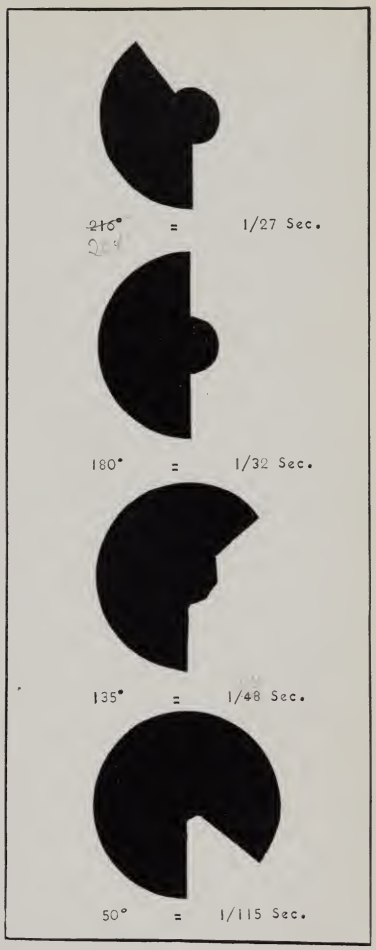
This is the shutter. Perhaps it's just as well that most novices make their pictures without ever realizing that the cine camera harbors such a thing as a shutter; but for the advanced worker, an understanding of what the cine-camera shutter does, and the relation it bears to the results on the screen, would be very valuable.

To begin with, why is a shutter? When we expose a frame of cine film, the film is held motionless in the aperture. Before we expose the next frame, the film must be moved, to bring an unexposed section into place. During this movement, we must cut off the light falling on the film from the lens, or our picture will be just a blur. So we have a shutter, which cuts off the light while the film is in motion. In most 16mm cameras, the shutter is a simple, rotating disc. Part of the disc is cut away, to let the light through for the exposure, for the disc rotates continuously.

The simplest way of stating how much of the period of each rotation the shutter is open, is by stating how many degrees of the full circle of the disc have been cut away. If one quarter of the disc has been cut away, we have a 90° shutter; if one-half has been removed, we say we have a 180° shutter.

Obviously, the larger the opening of the shutter is, the more light we will have to expose each frame of film. But there are some definitely limiting factors. Most important of these is the mechanical problem of moving the film. During the period between the exposure of two successive frames (that is, the time the shutter is closed), the film must be started, moved, and stopped dead. Clearly, if the open part of the shutter is large, the film must accelerate, move and decelerate very quickly, while if the open sector is smaller, the film can be moved more slowly and, accordingly, more gently. But we pay for this less strenuous movement by getting less light, acting for a shorter time, for our exposure.

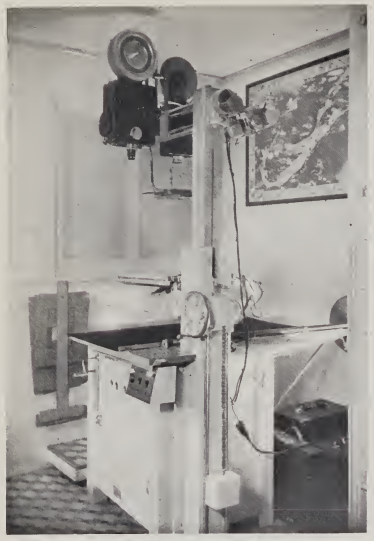
But what does all this have to do with ordinary camerawork?



Suppose you have a still camera, and the correct exposure for a given shot is f:8 at 1/25 of a second. If you shorten the time to 1/50 of a second, you'll have to open the lens up to f:5.6 if you want to keep your exposure the same.

It's quite the same in cine-camerawork. Suppose we have the familiar "Filma 70" camera, which has a shutter-opening of 216°. This gives us an exposure-time of 1/27 of a second. If we make a scene with this camera, and find that f:8 is the right stop to use, our exposure will be definitely different from what another fellow who has a camera with a smaller shutter-opening would have to use. Let's say the other fellow has a "Filmo 75," which has a shutter-opening of 135°. This will give him

(Continued on Page 410)



Animation for the Amateur

by
William Stull, A.S.C.

MAKING amateur animated cartoons will probably never become a popular indoor sport; too few of us can draw even one picture well—let alone the several thousand necessary to make a "Mickey Mouse." But animation can nevertheless do a great deal to liven up our home-made movies. In his recent article on making travelling-matte "wipes," Paul Lerpee, A.S.C., remarked that a number of very interesting "wipes" could be made by using animation in making the mattes. The same idea can be used in innumerable different ways to provide special effects, interesting or amusing scenes or sequences, and even to convey thoughts which cannot be captured by straightforward camerawark.

What is animation? Boiled down to essentials, it is the trick of photographing any inanimate object—such as a series of drawings, cardboard cut-outs, clay figures, or toys—one frame at a time, moving the object appropriately between each exposure, so that on the screen the object appears to move. In other wards, making an inanimate object appear animate. Notice, too, that drawings aren't the only things that can be animated!

To begin with a very simple bit of animation, let's take the spiral "wipe" matte mentioned in Lerpee's article. It began with a white card. Then a single line appeared, running down from the top to the center. This black line was then widened, a little bit at a time—photographed one frame at a time, of course—until it had swung around on the center of the frame, completely blacking out the field.

Suppose we want to do this by drawing: we begin with the plain white card. Then we draw the black line in, and expose one frame. Then we widen the line at the top until we have a V as slim as a slice of pie in a Scotch restaurant—and take another frame. Again we widen the V, and expose another frame—and so an until the V has broadened and broadened through the whole circle.

Now, suppose we want to do this by means of cut-outs. We can begin with our white card, and then draw in the first black line with a ruler. Next, we take several pieces of dead black paper or cardboard, a bit bigger than the white card: the black paper squares between which cut-films are packed will be perfect, if aur white card is small enough. On the back of them, we mark aff a circle with a compass and white ink or pencil. Take one of these as a template, and with a pair of dividers mark off as many divisions on the rim of the circle as we want to have frames in our wipe. Using this template, it is easy enough to cut out a series of segments, each af which is one division larger than the ane before it. The black line we've drawn on the white card will give us a mark by which to register the cut-outs as we photograph them one after the other. And there's aur matte—made by animation.

The same idea, by the way, can be used with a single circle if, after shaoting the white card, we change to a black card background and a full white circle, which is trimmed away bit by bit.

In figuring out these animations, it is a good thing to recall that the standard projecting-speed is 16 frames per second, and that while the average professional fade may run four seconds, the "wipe" is generally a faster transition, and shauld be accomplished quicker. The following table will help in timing not only these, but all animations.

Seconds	Frames	Seconds	Frames
1	16	10	160
2	32	15	240
3	48	20	320
4	64	30	480
5	80	60	960

In addition, it is well to remember that there are 40 frames to the faot of 16mm film, and 4,000 frames in the average 100-foot roll af film.

(Continued on Page 412)

Edit Your Ideas--- or Sweat

by
Karl Hale

HAPHAZARD snapshooting is fun . . . in fact it's easy; but like everything else, what comes easy must be paid for. Now, pay for it in trying to edit your film that you shot this summer during your vacation and on your trips.

Movies can never be a series of snap shots, they must have continuity . . . meaning interest. Even a still picture to be worth keeping should have interest.

If a scene is worth taking it is worth shooting from several angles or at least from a long shot, medium and close-up. If your scene hasn't that do not shoot it. In other words edit your idea before exposing your film.

The average shooter in Europe does not have the money the American cinefilmer has to put into film. The result is that the making of a picture is an event with him. He does not try to see how quickly he can shoot his hundred feet, but how well he can shoot it. He must make every foot count.

We heard of one chap, in the still picture field, whose quota was 12 negatives a year—not twelve rolls, but twelve negatives. He couldn't afford more. Each one of his shots was thought out for many weeks before it was made. He waited until the light was right. In fact he spent weeks and months planning and watching light and only minutes in his shooting. Of course, we do not have that patience, but still there is no use of us not getting more for our money.

We often read suggestions something like this. You are going on your vacation; you are going by auto, so why not open up with the car driving off? You use the car so much today that an auto does not mean a big trip, it does not mean vacation. In fact you might be going to the theatre, to visit your relatives or in fact to any event. The scene of the auto as an opener is hackneyed; it's a bromide unless you can get some other angle on that auto, some other twist on it. The straight shot of an auto does nat take any thinking, it is the simplest thing, you are traveling along the lines of least resistance.

However, you are back from your trip, you have done your shooting and now you want to make your film interesting. That means editing and it means titling.

If you cannot edit or title, or are afraid of it, it is your first effort, send your film off to some professional editor, give him the story of the trip and watch his results. Then from that film you will learn a lot about editing and titling.

One thing you will learn that he does not make his scenes too long. He is not afraid to cut. He is not afraid to eliminate scenes entirely that are not vital ta the continuity or that are not interesting.

Remember you are biased. You saw the original scene. It amazed you, but your shot of it may not amaze anyone. You are still hypnotized by the original scene. It still returns vividly to your imagination every time you see your shots of it; but that isn't true of the other fellow. He will be bored stiff.

Some people will tell you not ta use many titles. If your film needs them, use them. After all it is yaur film; it is your story. If you put the titles in you will not have to supplement the picture with a verbal description.

Another thing that will help your film is dressing your titles up. See that they are properly centered. See that they are spaced right. And see that they are squared with your frame. If you have a great number af them and you use a typewriter titler and you want black background with white letters, why not go out and buy yourself a hundred feet of positive film? It will cost about a dollar, and a few cents more to have it developed, but you will have nice snappy black and white titles. If you can set your lamps about 12 inches fram your title card, use two photofloads and use an apening of abaut f:8. You will find you have made a swell exposure and that your blacks will be coal-black and your letters very white.

Most of this is addressed to the beginner. The advanced amateur has familiarized himself with the basic principles of title making and editing. He wants the more tricky stuff and the arty line. There are many, however, who do nat have the background to permit them to go that far in photography, therefore these instructions in the a.b.c. of editing.

But a bit more about cutting your film. If you haven't a story try to dope out something that will tie your unrelated scenes together. Perhaps you can use a map. You might shoot people on your frant parch. Shoot a close-up of one person speaking to another with the fallawing title: "Where Did You Go On Your Trip?"

You go back to a long shot. Show him taking out an auto road map, pinning it up an the wall ar laying it down on the table. Show him point with his pencil to the city

(Continued on Page 411)

Breaking Cine Traditions

by
Wm. J. Grace

USUALLY an article of this kind appears just about the time most filmers are packing up and pushing off on vacation trips, but I'm going to reverse the procedure and tell what happened on my recent trip instead of what I hoped would happen. This type of article, appearing before the filming season, is ordinarily published as a source of inspiration. Hindsight, however, is often better than foresight, and while my own experiences of filming my trip are fresh in my memory, I'm setting down what I learned on our Colorado trip this year.

Because I was a Graflex enthusiast long before amateur movies entered my life, I took along my little 2¼x3¼ RB Graflex, as well as my 70D. My wife, to whom I offered a small new camera, took along a battered old box Brownie, probably out of sentiment—the box Brownie had made so many trips with her she couldn't bear to turn traitor and use another camera.

That made three cameras, and two of the cameras went with us everywhere we went, and sometimes all three were in action. Why take any still shots when we had a movie camera along? Simply because there are still places where snapshots are better and more practical than movies —and they are a lot less expensive. One still picture can often tell just as much as a movie shot, especially where the subject is inanimate. Another instance of the superiority of a still picture over a movie is in filming interiors when the light is poor. A ten-second time exposure gave us excellent indoor shots of the picturesquely rustic Inn where we spent most of our vacation, where a movie would have, of course, been out of the question.

For film, we used Verichrome exclusively for the two still cameras, and Kodachrome (without any filters) for the movie shots. We would have liked to use color exclusively, but it hasn't yet been placed on the market in pack and roll film form to fit our cameras. If we'd had a Leica or a Contax, of course, we would have used color even for stills, for color is available in 35mm film.

Our reason for selecting Verichrome for stills was that the amazing latitude of this double-base film makes it almost impossible to under or over expose. I have made many stills of equipment and when I run across a subject that simply does not allow of retakes, I always make one shot undertimed and another overtimed. Almost invariably, both shots look as if they'd been timed exactly the same. For example, I recently made a 5-second shot and a 15-second shot of the identical subject, and they both looked perfectly timed. On another occasion, I used a single Photoflash for one shot and two Photoflashes for another of the same subject, and I can't tell which is which. We found, also, that Verichrome renders foliage and human flesh tones very well.

But when it came to selecting movie film, Kodachrome it was, and no alternative. When Kodachrome first came out, I shot a roll experimenting to learn its possibilities and shortcomings. So natural was the coloring that we didn't use a single foot of black-and-white. It is my personal opinion that scenics are most disappointing when made on black-and-white for the simple reason that what makes most scenery beautiful is the color, not the form. We mentally picture the scenes we have seen for their color, yet black-and-white film abruptly forgets all the nuances of color shades, and our memory is severely jolted.

In shooting Kodachrome, I had found that using a Weston film speed of 5 gave good results, altho 6 is found in Weston's chart which has been recently mailed to owners of their exposure meter. If the scene is slightly overexposed, the coloring seems to be more delicatly natural, especially in scenics. The chief trouble with past color films has been in their tendency to overemphasize the coloring, and because Kodachrome isn't so blatant in its coloring it makes it the first really decent commercially available color film.

If I seem, by virtue of my enthusiasm for Kodachrome, to be working for the Eastman Company, please forgive me. You who have followed my articles for the past year and a half know I scatter as many sour grapes over inadequate equipment as orchids over good equipment. Primarily, Eastman develops, makes, and sells film, not equipment, and when two films as excellent as Verichrome and Kodachrome are put out at reasonable prices, I think they should be highly complimented.

I don't often take a trip, but when I do, I feel that part of the cost of the vacation should include a good supply of film. After all, memory does fail, dim with the passing of years. And at least as much pleasure is obtained reliving the sights and scenes of one's trips thru movies and stills as one has on the trip itself. When I

(Continued on Page 406)

Leicaphoto by Nina Morgan

A Day with Your Dog

by
James L. Fritz

IN THE following script we will endeavor to transport onto paper and film what your dog thinks and feels during the course of a day in his life. You will find that this little story is simple to photograph by merely following your dog on his every-day acts. It should also prove to be a never-ending source of entertainment and amusement to you and your immediate friends. The time is any day in the life of your dog. The characters are: your dog, regardless of breed or size; yourself, and wife.

Scene 1. Close-up shot of a clock. The hands are pointing to 8 o'clock.

Scene 2. Med. shot of the dog. He is asleep. Slowly he opens his eyes, yawns, stretches, and shakes himself. He looks up at the clock.

Scene 3. Title . . . Good gosh, look at the time. No wonder I'm hungry. I wonder if Bob is up yet. Guess I'd better go and woke him. (Note: substitute your own names for those used in the script.)

Scene 4. Close-up shot of the dog. He yowns again, then walks out of the scene.

Scene 5. Med. shot of a man asleep in bed. The dog leaps into the scene and lands astride his master. The man opens his eyes. As soon as the dog sees that he is awake, he licks the man's face. The two engage in a short scuffle. The man pushes the dog off of the bed and gets up. Both walk out of the scene together.

Scene 6. Med. shot of the dog sitting before the ice box awaiting his master. Man's legs enter the scene and the ice box door swings open.

Scene 7. Close-up shot of the dog's tail. It is wagging anxiously.

Scene 8. Close-up shot of the man's hand setting down the dish of food. The dog thrusts his head into the scene and the man's other hand comes into the scene and pushes the dog's head back and sets down the dish. Both of the man's hands then leave the scene and the dog begins to eat.

Scene 9. Med. shot of the dog finishing his breakfast. He licks his chops then walks slowly out of the scene.

Scene 10. Med. shot of the dog sitting by the door. He scratches on it then sits back down and looks back.

Scene 11. Title . . I wish Bob would hurry up and let me out. When a fellow has gotta go, he's gotta go.

Scene 12. Med. shot of dog sitting by the door. The man's legs enter the scene. The door swings open and the dog rushes joyously out.

Scene 13. Med. shot of the dog lying under a tree. Suddenly he jumps up as if a thought struck him.

Scene 14. Title . . . I wonder where that cat from next door is? I haven't seen her around lately, guess I'll have a look around.

Scene 15. Close-up shot of the dog looking around a corner of the house.

Scene 16. Med. shot of the dog sticking his head under the back porch or steps.

Scene 17. Med. shot of the dog looking through the fence. Suddenly his ears go up.

Scene 18. Title . . . There she is now, the hussy.

Scene 19. Close-up shot of the dog barking furiously. He barks for just a moment then stops.

Scene 20. Title . . . Look at her run. I guess I sure got her told. I feel like a little lunch now, I suppose I'll have to go and dig some up.

Scene 21. Med. shot of a flower bed. The dog walks into the scene, sniffs around for a moment, then begins to dig, tearing up most of the flowers. Finally he thrusts his head into the hole, and comes up with a huge bone grasped triumphantly in his teeth.

Scene 22. Title . . . Boy, what a mess I made out of that place. I'll catch holy Ned when Grace sees it, but I don't see why they have to plant their old flowers on top of my bones anyway.

Scene 23. Med. shot of the dog lying under the tree eating the bone. Mistress' legs are seen coming into the scene, walking purposefully toward the dog. They stop before the dog. He cringes a bit and looks up guiltily. Mistress bends down over the dog, a switch is in her hand. She shakes it menacingly in the dog's face. The dog looks up at her, then puts his head down between his paws.

(Continued on Page 411)

WHEELS OF INDUSTRY

Brooks Light Filters

● Some photographic amateurs are still working with orthachromatic material. This is extremely sensitive to blue, less so to green, and not at all to red. An unfiltered exposure on this emulsion reveals that blue is rendered much too light, so that an ordinary landscape photograph is reproduced with the sky as light as the clouds, thus making the clauds invisible. The obvious remedy for this is the use of a filter which reduces the amount of blue light to reach the film. Such a filter is the Optochrom Yellow. Produced in four densities, marked 0, 1, 2, and 3, this allows us to control the amount of blue light we wish restrained. The deeper the color of the filter, the darker is blue rendered. Correction for red with this emulsion is obviously impossible.

With the modern highly red-sensitive panchromatic emulsion the problem is a little different. While this film is still highly sensitive to blue, it differs from the orthochramatic by displaying a weakened sensitivity to green, and a greatly increased sensitivity to red. Since the yellow filter does only part of the job, that is, taking out some blue, but does nothing to subdue the red, a new filter was conceived. This is called the Universal Green. A yellowish green in color, the effect of this is to impede the transmission of blue and red while allowing the comparatively unobstructed passage of the green rays. This filter is made in twa densities, marked 1 and 2, with factors of 2 and 3 times respectively.

Since the latest orthachromatic emulsions can in a certain sense be considered panchramatic, except far the absence of red-sensitivity, this new filter can be used with them also, having in this case an equivalent effect to a yellow of equal density. Even the same multiplying factars hold true! Hence the name Universal.

In connectian with phatgoraphy by artificial light, filter research has gone off an an entirely different tangent. Because of its speed, panchromatic material has been almost universally used by photographers for work under the tungsten lamp. However, since the spectral compasitian of this light is entirely different from that of daylight, being rich in red and yellow, and comparatively poor in the blue rays, still another, and tatally different filter became necessary. This was born and christened the Optochrom Blue. A very pale blue, this filter subdues the yellow and red rays, while allowing the blue to pass practically undisturbed. It requires an increase in exposure af only 50%!

A portrait of a blonde-haired person with blue eyes and red lips, taken without a filter in tungsten light looks mighty queer indeed. The eyes are rendered quite dark, the lips much too light, and the facial color rather pale and without life. The use of a pale blue filter, with its characteristics as described above, changes all this so that a correct rendition of the tone values results.

Of exceedingly great interest also are the three special filters devised by Optochrom. These are termed the Optochrom Reform, U. V., and Red.

The Reform, used in landscape work to hold back the distance and for an improved rendition of the sky, is a steeply graduated filter of circular shape, ranging from clear glass to deep yellow. No increase in exposure is required.

The U. V. is practically colorless, used in mountain photagraphy, to absorb the ultra-violet light to which the photographic emulsion is normally oversensitive. There is no appreciable increase in exposure.

The Optochrom Red, for use with panchromatic and infra-red emulsions, does several interesting things. It is unexcelled for photography of far distant views and for exposures in misty weather. Its rendering of blue is so dark that it is possible to produce convincing night effects in brilliant sunshine. Its rendering of cloud formations is magnificent. With panchromatic material the exposure factor is from six to eight times. With infra-red, about thirty times.

These filters are distributed in the United States in all types and colors by Burleigh Brooks, New York City.

Fried Light Tester

● Recent announcement by Fried Camera Company of their 16mm light tester brought to the professional and semi-professional laboratory field a piece of machinery that is considered a vital part of the 35mm field.

This light tester is small, compact and efficient and has been adopted by such laboratories as Dunning Process Company for their 16mm negative and positive work.

This light tester gives the correct printing light of every scene. Because it uses only a half-dozen frames of positive film for each reading it is considered highly economical.

It is adjustable so that it can be set for any individual printer. While it may be used as a companion piece of the 16mm Fried printer it can be adjusted

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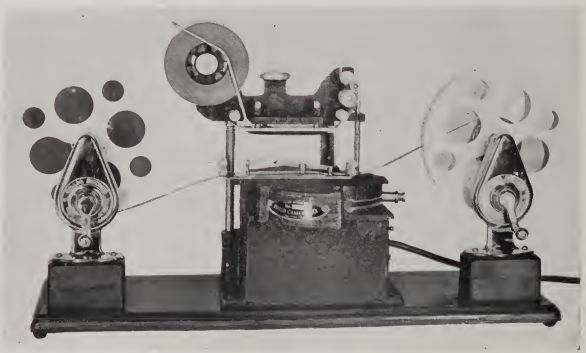

All things TO ALL MOVIE MAKERS

CINÉ-KODAK SPECIAL

MOST VERSATILE OF ALL 16 MM. MOVIE CAMERAS

THE basic model of the "Special" possesses many features, permits many effects, beyond the scope of any other 16 mm. camera. This makes for economy. Those refinements of cinematography which are, in some cases, available as accessories to good movie cameras, are already built into the "Special"—they need not be purchased individually as expensive extras.

Yet, even this unmatched range will not always suffice. Hence, its few accessories. The Electric Motor Drive is for exposure throughout the unusually wide speed range of from one to sixty-four frames per second. The Lens Extension Tube Outfit permits extreme magnification of minute objects without the assistance of microscopes. The Optical Finder, which eliminates parallax, can be calibrated for all focal length lenses from 15 mm. wide angle to 6-inch telephoto and shows the correct field of these lenses from infinity down to two feet while the camera is being operated.

Specialists in many fields would be hard pressed to imagine the need of greater cinematographic versatility than this. Yet it occasionally arises. Here, again, the "Special" is the answer because the instrument shop in which it is fabricated will undertake to adapt it to meet any individual specifications submitted for estimate.

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Free—For a further outline of the possibilities of this outstanding camera, write for "Presenting Ciné-Kodak Special," a free booklet available upon request from the Eastman Kodak Company, Rochester, N. Y.

BREAKING CINE TRADITIONS

(Continued from Page 402)

shoot, either movie or still, it's with the thought that perhaps I'll never pass that way again. When I see something that's different, I shoot. When the impulse says "get it," I'd better get it right then and there, for bitter regrets don't fill reels or albums.

Perhaps I have some queer ideas of how movies of scenics should be made, but then a lot of those "crazy" ideas seem to hold water, so I constantly do things I'm told not to do. For instance, it isn't supposed to be proper to take movies from a moving car, or thru the windshield. Why? Because the motion of the car jiggles the camera. Because reflections in the windshield confuse the picture. So?

Now let's argue those points my way—you don't have to agree with me, you know. This discussion is in no way to be taken as agnostic. You say movies shouldn't be taken from a moving car, because the car jumps up and down over bumps, twists and turns around road curves. I quite agree that movies taken from a moving car do just that—and upon this do I base my theory that they make interesting movies. When you tour do you stop every few miles and just sit looking at the view? You do not. Then why expect movies tcken on a trip to "sit still"? Whether you've thought about it or not, one of the very things that makes touring so interesting is the constant changing of relations between foreground and background. If you just sat and looked awhile here, and moved on and stopped at the next place to sit and look, the sights wouldn't be nearly so absorbing. Then why not film them that way?

Naturally, your camera is going to jiggle up and down. Naturally some things will blur. So what? Isn't that just what it looks like to our own eyes on tour? If you're making a movie of moving subjects, the camera need only move to keep up with the subject. Further movement of the camera there would be extraneous and confusing. But when filming scenics, you do the moving, so why not film with the camera moving?

I have found, when travelling in strange country thru which I expect to return, that I can make better pictures and waste less film on less interesting shots by not taking any pictures on the outbound leg of the journey. In that way it's possible to get the "lay of the land" as well as seeing the scenery, and the return trip will net interesting shots at a minimum of footage.

Another pet theory I tried out on the trip was the matter of panorams. Long ago I learned that the best way to waste film and bore my audiences was to make what is considered a good pan—slow and steady. It dosen't make a bit of difference how firmly the camera is supported, it still is one of the poorest things one can do with a movie camera, this panning. There is only one thing that can be said for panning, and that is that the related portions of the subject are tied togeher. A pan proves that the first and last parts of the subject are such-and-so distance apart.

When we went down into the Royal Gorge we wanted to show the torrential stream roaring along the rocks, the steep canyon walls, and the height of the sight-seeing bridge over the top—all in one pan. I made it this way: about a foot was made of the river, then a quick swing up the side of the canyon, then a slow pan (looking straight up) of the bridge, then a fast swing down the other side of the canyon, finishing with another foot of the river. It didn't take a lot of film, is interesting to watch on the screen, and shows perfectly the dizzy height of the towering walls. In fact, it's just about the way one would sweep one's eyes over the place.

In practically all my shots I tried to include a rock or tree or fencepost—anything in the near foreground to establish depth to the scene. One of the best shots I have was made from the moving car, with the camera pointing cut of one of the windows at right angles to the car's motion. Tall trees along the side of the road flash quickly by and between trees the great distances of far-away mountains peep thru. The great contrast of flashing nearby trees and steady, unmoving distant mountains makes a truly scenic movie. Makes you feel as if you were in the car with the camera.

Having broken so many traditions in making my movies on this trip, I probably will hear of others who tried the same thing but didn't get away with it. It all depends on what you want in your pictures as to whether one scheme or another will satisfy you. If you want rock-steady movies of still scenery, stop and set up your camera on a Beltipad or a tripod. Personally, I wanted motion as well as scenery, and I like my results as much for their motion as for the scenery. True, I used a Beltipod all the time, and that is probably why even the difficult shots from our moving car turned out so well.

One thing more, tho, while I'm talking about trip experiences. Next time, my cameras will be a lot different than they were this time. Instead of a five-pound Graflex measuring about 5 inches all around, I'm going to have a reflex type which uses 35mm double frame (like the Leica size). And it's going to require no carrying case—it'll hang on my belt, ready for instant action, yet protected from water and dust when closed. For another thing, I'm going to have that "ideal camera" I wrote about a few months ago. Especially would I require that it be dust and rain-proof in its own right. It's a mess to lug the heavy carrying case, yet the camera must be protected from the elements.

Perhaps a few of my readers will not yet have taken their trips when this article appears, and if it will be of any help in selecting equipment and film, I trust what I found out on my own trip may have been worth your while to read about. At any rate, I had to get it off my chest.

THE ART DIRECTOR IN 16mm

(Continued from Page 398)

to get rid of things that only detract and never really belonged there in the first place. Try it and you will see how much beauty a few simple things will add to the scene.

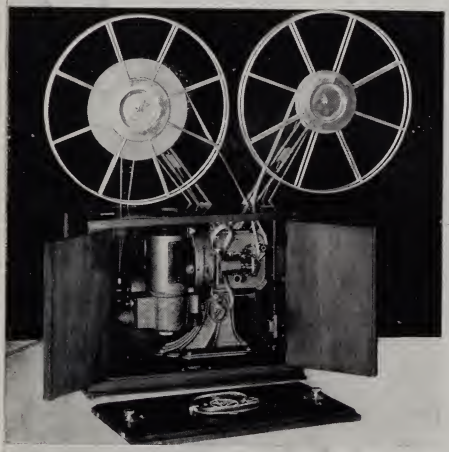
If you happen to be near a dock at the waterfront, masts, spars, ropes and all those interesting things about a ship can come into the scene and your composition will be dynamic. There is always something about ships that appeals to our emotions, and if you study your shooting script you will be able to make the shots in their proper sequence, or montage.

It is the montage, or mounting, that makes the picture vital. We are about to take a sea trip and it is possible to show us getting under way without showing a living person with the proper mounting. First, the camera moves to the gangway, we are aboard deck, pan to main hawser that holds ship to dock. Cut to closeup of rope being pulled on board, cut to boat leaving dock, shoot over the stern and show wake as boat gets away. If sailing vessel the canvas is unfurled and being hauled up, cut to shot looking down on stern deck, wake is now thinning to a long line as our

Beauty

IS THE LEAST ATTRACTIVE FEATURE OF THIS *New* VICTOR

16 mm Model 21



Harmony of line, the deep, rich lustre of natural walnut, and the quiet dignity of antique silver endow this latest VICTOR with a beauty that is entirely new to 16 mm. projector manufacture. Mere physical beauty, however, becomes only an "added attraction" when considered in the light of the mechanical perfection, completeness and supreme convenience of the Model 21.

This New Victor's beauty will win your admiration. It's performance will earn your undying respect and unstinted enthusiasm!

☆ **Features include: ☆ Super HI-POWER ILLUMINATION (750 watt) with super-efficient SPIRADRAFT VENTILATION ☆ 1600 FOOT FILM CAPACITY ☆ New SWING-OUT LENS MOUNT with integral framer and focuser ☆ Centralized 4-in-1 CONTROL (Forward, Reverse, Still Projection, and Neutral) ☆ RAPID POWER REWIND, PILOT, LAMP SWITCH, Rack-and-Pinion TILT, etc., etc.**

AMONG the several established, standard VICTOR features embodied in the Model 21 is the universally famous AUTOMATIC SAFETY TRIP which provides VICTOR users with POSITIVE PROTECTION against mutilation of PRICELESS FILMS . . . . a patented refinement not to be had in any other equipment at any price.

YOUR DEALER can arrange demonstration which will reveal numerous other attractive features. Complete as illustrated (except for 1600′ reels), MODEL 21 is priced at ONLY $185. (Other Victors as low as $120.)

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World's Finest 16 mm Motion Picture Equipment

ship begins to roll with the swelling of the sea. Everthing is shipshape now aboard and we pan into the crew sitting about as we sail off to meet the distant horizon. Cut to sailing ship cutting across camera angle and follow until it is almost out of frame line. Cut to long shot. We now are on the high seas and your script takes up the action, and there is plenty of action aboard ship as she rocks and rolls her way to other ports. Action, that is real motion pictures.

These few sketches will help the 16-mm cameraman build up the scene, composition, and he will know that no other person has a picture like his, it is part of him on the screen, even if he is never in front of the lens.

Negative-Positive Home Laboratory Work

(Continued from Page 397)

the hypo will have hardened the emulsion so this can be done safely. When all the film is on the drying drum, loosen the ends and work the slack throughout the whole film so each turn hangs loosely on the drum—otherwise it will shrink tight in drying and stretch the film. It is also good practice to wipe the back of the film dry by running a chamois under the film while the drum is revolved. This eliminates water marks—where drops of water dry—and makes further cleaning unnecessary. Film properly squeegeed onto the drying drum will dry quickly, which is another requirement for fine grain results. When dry, the film can be rolled up on a reel and it is ready for the preliminary editing.

Before printing any negative, it is advisable to cut out over-exposed frames at the beginning of each scene, at least, and do other preliminary editing according to the subject matter and the desires of the worker. Often scenes can be re-arranged before printing and splices eliminated in the finished print. When preparing the negative for printing take about two inches from each scene or group of scenes having the same density, and splice them together in the same order as the negative. This short piece of film containing bits from each scene is used in determining the correct printing lights for the picture. After the negative is spliced for printing, it is cleaned by running it through a clean cloth to remove any dirt particles adhering to it; this is easily done on the rewinder, care being used not to put too much pressure on the film and cause scratches. An old linen handkerchief that is soft from many washings is good for this purpose although velvet is often used. In cold weather, velvet will often electrify the film so that dust particles in the air will be attracted to it, making matters worse rather than better. Linen does not cause this trouble and is to be preferred.

Making the Positive

Before printing the negative, the correct printing light must be determined for each scene. This is done by making a print of the spliced up test negative using a medium light on the printer, and developing this test for a standard length of time in positive developer. When fixed, the test print is examined for density and it will probably be found that some scenes need more or less printing light. Another test is then made on a stronger or weaker printer light and this test examined. Usually two or three such tests will enable the worker to pick out the correct printing light for each scene, after which a "timing sheet" is made up showing the printing lights for each scene to serve as a guide.

The negative is then ready to be printed so it is placed on the feed spindle of the printer with a roll of positive stock on its feed spindle. The two films are then threaded through the printer, their emulsion sides in contact and with the negative toward the light. The light control is set for the first scene and the printer started. By watching the picture in the aperture or the scene change signal, the operator should change the printing light where needed according to the timing sheet made up from the tests. This method of testing each scene beforehand assures the positive being rightly printed the first time and is a big film saver in the long run.

When printed, the positive film is wound on the developing drum and developed in the same way as the negative except a positive developer will be used—and a much shorter time. Eastman's No. 16 developer is a good one but the following is simpler to mix and will appeal to those who compound their own:

Metol	44 grains
Hydroquinone	175 grains
Sodium Sulphite	2½ ounces
Potassium Carbonate	1½ ounces
Potassium Bromide	16 grains
Water	½ gallon

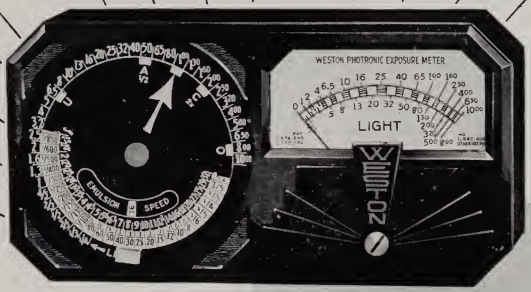
This developer keeps well if bottled air tight when not in use and will prove suitable for titles as well as prints. At 68° a good development time is 3 to 4 minutes—either can be selected in developing the tests, after which the print should be given the same time so as to reproduce the test densities.

When development is complete, the print is rinsed, fixed, washed, dried and cleaned in the same manner as the negative. In fact, positive development is identical with negative except for the formula of the developer and time of development—and, of course, a bright red light can be used instead of the green required for panchromatic film, which enables the worker to see what he is doing. For this reason, the beginner can do well to shoot some positive film in the camera and develop it as a negative, using the red light, in order to get familiar with the apparatus before trying to work with the faint green light on negative film. When the film is dry, it can be rolled up on a reel and is then ready for screen inspection and any further editing that may be necessary.

It might be well to give some information about negative grain and how to keep it as fine as possible, even though the negative films now supplied are inherently fine grained. A fine grained emulsion is the right start but exposure and development also affect the grain size so that care should be taken to get the most out of the film. Generally speaking, thin negatives will show less grain than dense ones, so the worker should try to give exposures that will give just sufficient detail in the shadows with a normal development. Under-exposure and forced development is to be avoided as it will always increase grain size as will over-development on normal exposures. In general, strive for as thin a negative as possible without sacrificing any of the details of the picture, do not force the development, develop in the D-76 developer and dry as rapidly as possible. With this care any of the modern 16mm negative films will produce results entirely satisfactory as to grain.

The worker who has learned how to develop and print his pictures has a process available that will permit many special effects that are not obtainable on reversal film, such as wipe-offs made with mattes as described in the August 1935 American Cinematographer. With fade and iris mattes, this same procedure will put these effects as well as lap dissolves into any picture easily and without any special camera work. Dupes can be made on the printer, either by printing a negative and then another positive or the positive can be made by reversal as explained in the July 1935 Cinematographer. With the negative-positive process, the density of the positives is under complete control, so that thin positives can be made when they are to be shown to extremely large size or in semi-daylight. In fact, so many things are possible to the serious worker, that he will be well repaid for his expenditure of time and money in learning how to develop negatives and make prints from them.

MEETS *Every* EXPOSURE NEED



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Your dealer has the new Model 650 in stock. See it today. Arrange for a demonstration; or, write for complete information . . . Weston Electrical Instrument Corporation, 598 Frelinghuysen Avenue, Newark, New Jersey.

LET'S TALK ABOUT SHUTTERS

(Continued from Page 399)

an exposure-time of 1/43 of a second; so, if he is to match our exposure on the scene, he will have to shoot it at f:6.3. If with the larger camera we are shooting at f:2.5, he will have to open up to f:1.9—and if we are shooting at f:1.9, he won't be able to shoot at all, for he would have to open up to approximately f:1.1 to match our exposure!

Now, using the smaller stop, our lens would have much more depth of focus than would the lens on the one with the smaller shutter: and this difference would be increasingly noticeable as we opened the lens to wider and wider apertures, or as we focused on nearer objects, as for close-ups.

On the other hand, in the matter of getting clear pictures of fast-moving objects, the camera with the smaller shutter-opening has a distinct advantage. The smaller shutter aperture means a shorter exposure period; and that, in turn, means that the image will have less time to move—and blur—than would be the case otherwise. If you're making stills of a football game, you want a camera whose shutter gives short exposures; if you're filming the game, you'll get better results with a smaller-aperture shutter.

Obviously, the solution to the shutter problem would be an adjustable shutter, whose aperture could be varied to suit the shot. All professional cameras have such variable shutters; in fact, nearly all 35mm cameras have shutters that can be adjusted: the better types permit this adjustment while the camera is running, but all allow it in some way. So far as the writer knows, but one 16mm camera (other than the costly custom-built ones) has this feature. In the early days of substandard filming, when cameras were being designed for the foolproofness that would permit safe operation in the hands of folks who had never before made movies, eliminating the variable shutter and its complication was undoubtedly a wise move. Today it is different: there are hundreds—probably thousands—of 16mm cameramen who have advanced to the point where they could use such a fitment intelligently, and to very good advantage.

Here are some of the ways they could benefit their pictures by varying the shutter-opening—ways that professional cinematographers are manipulating their shutters every day.

Most obvious of all, of course, is the making of fades and dissolves in the camera. That in itself is enough to make most amateurs eager for a varying shutter!

Next (and much more important) is controlling the exposure without altering the lens-setting. Remember, reducing the lens-opening increases the depth of focus, and increasing the stop reduces depth: such changes between closely related scenes are not pleasing; and when light fluctuations, such as a cloud passing over the sun, for example, make such changes necessary within a scene, they are doubly objectionable. By controlling the light with the shutter, we can avoid these changes. For instance, referring to the chart on p. 49 of the **American Cinematographer Handbook,** we see that if we are working on one of those days when small clouds are dancing across the sun, we can set our lens at, say, f:8, with the shutter at 90° and get the same exposure as though we used f:11 and 170° shutter. Now, when a cloud obscures the light as we are shooting our scene, we can keep the exposure uniform by simply opening the shutter to a wider aperture: if the clouded light would be a normal f:8 light, all we need to do is open the shutter to 170°—and we get the effect of increasing the exposure as we want to, without changing the quality of our picture.

The same thing can be tremendously useful in panoramming and moving shots. Suppose we are following a person walking from the bright sunlight into heavy shade. Let's say there is a good three stops difference in the light at one end of the shot and the other. We can begin the sunlit end of the shot with the lens open three stops wider than normal—say at f:5.6—and the shutter closed down to about 50°. As our actor moves into the shade, we open up the shutter, ending with an aperture of 170°. Throughout the shot, both exposure and quality will be uniform, for we offset the changing light by increasing our exposure time from 1/115 second to 1/32 second.

The same expedient will prove equally useful in super-speed "slow-motion" shots, as well as in undercranked quick-action scenes.

Again, too, the controllable shutter will prove its worth in scenes of fast-moving action, for by reducing the shutter aperture, we cut the exposure-time, and get sharper, less blurry pictures.

When can we expect to find controllable shutters on substandard cameras? That, ladies and gentlemen, is on the knees of the gods—and on the drafting-boards of the camera manufacturers. As yet, only one camera — the Cine-Kodak Special—is available with this feature. The manufacturers state that the design of most of the present models

prohibits the addition of such a fitment; there is not enough room available in the camera's case for such an addition. However, more than a few whispers hint that the de Luxe, semi-professional models being quietly developed for the advanced worker, will include these professional shutters. Meantime, the thing to do is to convince the manufacturer that the advanced amateur really exists, and that he wants a camera capable of more than casual snapshotting!

Edit Your Ideas---or Sweat

(Continued from Page 401)

where he lives. Let the pencil travel to a certain point of the first stop. If you can shoot a close-up so that the city can be read so much the better. Then cut in your scenes.

From here on we let you use your own imagination. Imagination is important in cine filming. That's what makes it fascinating. If it did not appeal to the imagination it would not be so popular.

A Day With Your Dog

(Continued from Page 403)

Scene 24. Title . . . I wonder how I'm going to get out of this. I know, I'll try being cute.

Scene 25. Med. shot of the dog and Mistress. Dog rolls over on his back and hangs his paws limply in the air. Mistress smiles, then with a final shake of her switch, leaves the scene.

Scene 26. Title . . . Whew! That was close.

Scene 27. Med. shot of the dog as he resumes eating his bone. Suddenly he stops eating and begins to scratch behind his ear.

Scene 28. Title . . . There's that darn flea again. If it ain't one thing it's another.

Scene 29. Med. shot of the dog. He continues to scratch. He quickly turns his head and uses his teeth to scratch another part of his anatomy. Finally he stops and gets up and shakes himself vigorously.

Scene 30. Title . . . Got him that time. Whata life, whata life.

Scene 31. Med. shot of the dog sitting on the front steps. He is looking down the street. Suddenly his ears go up as he sees something.

Scene 32. Title . . . Here comes that swell looking lady dog that just moved in up the street. Is she a snooty wench. I'll do one of my tricks when she passes, maybe she'll notice me.

Scene 33. Med. shot of the dog sitting on the front steps. His head slowly turns as if he is watching the other dog coming toward him. When he is looking into the camera he sits up in a begging attitude. He sits up for only a moment, then drops down to a sitting position again (or whatever your dog may do).

Scene 34. Title . . . All I got for that effort was a dirty look. Oh, well, she knows I'm alive now, and that's something. Guess I'll go find Bob, maybe he'll play ball with me.

Scene 35. Med. shot of the man asleep in a lawn swing. The dog enters the scene and jumps up beside the man. He lays his head affectionately on his master's leg and blinks his eyes sleepily.

Scene 36. Title . . . This is an idea, I've had a pretty hard day, too. I'd better stay here, it takes a man to understand a man.

Scene 37. Med. shot of the dog and the man, both are asleep. Scene fades slowly.

Scene 38. Title . . . The End.

ANIMATION FOR THE AMATEUR

(Continued from Page 400)

But after all, not all of us make negative-positive "wipes"; what else can we do with animation?

Well, take the matter of titles: we've all seen professional titles in which the letters danced around the screen until they formed words. Animation did it—and animation that any of us can duplicate. Let's say we are shooting on reversal film; we'll begin with a plain black card, and use cut-out white letters, which we can make ourselves, or buy. The business of tumbling them into the frame is easy enough, and the possibilities are limited only by individual imagination. Moving backgrounds of geometrical designs can be animated with the letters, too. But suppose we've a set of block letters—you know, those carved wooden affairs you can buy in a toy-shop or a 16mm supply store: here's yet another opportunity for title-animation. Just set up your camera and background — and move the letters about as you did the cardboard (or celluloid) cut-outs.

Now, suppose we're serious-minded, and are making a documentary film that illustrates some process like the operation of the diesel engine. Here is something that can't well be photographed in action—yet which is best explained by being shown in operation. Once more, animation to the rescue! Our starting-point this time is a diagram or cut-away drawing of the diesel cylinder. To match this, we make a cut-out of the piston, the valve-mechanism, and so on. Setting the piston, etc., in the proper place over the drawing of the cylinder, we secure our animation by moving the cut-outs and photographing them, frame by frame. To show how the air is compressed, we might use sand, scattered thinly through the "combustion-chamber" at first, and gradually gathered together as the pistan travels up. The injection of the fuel might be represented by cut-out strips of dark cellophane, and the explasion by cut-outs of light cellophane, or tinfoil, with the exhaust gases represented by dark sand.

The use of animated figures has been rather neglected professionally, but it can produce results no less interesting — and imaginative — than animated cartooning. The Kodak Cinegraphs of "Chip, the Waaden Man," "Doodlebugville," etc., were made by this method. These films were made with rather elaborate miniature sets, and jointed figures fitted with several sets of faces, to permit animating facial expressions and lip-mavements; but very fair results can be had with ordinary dolls—especially the jointed variety. The principle of animating these figures is the same as animating drawings, cut-outs, or anything else. It is something of a problem, at times, to keep the dolls balanced (they have a delightful habit of tumbling just at the most critical moment). If you can hollow away the bottoms of the feet, replacing them with lead weights, it helps a lot. Obviously, animating dolls is a time-consuming, temper-twisting task—too much, perhaps, to permit the average man to devote even a fifty-foot reel to animation alone. But many interesting short sequences with animated dolls can be worked out to enliven films of children. And how a juvenile audience will revel in such a sequence—even if it is brief!

Quite a few amateurs of my acquaintance pride themselves at making "still" enlargements from 16mm frames. Here again is something that can be combined with animation. For example, animated dolls or drawings could be combined with actual photography by enlarging selected frames—say every second or third frame of the scene—and using the enlargements as backgrounds far the animation. Without doubt, a deal of skill and patience is required in making the enlargements, but it can be dane. For quick "wipes" and the like, it might even be possible to use this method, though there would undoubtedly be a more or less noticeable variation in contrast, grain, etc., between the actual scene and the copied-enlargement sequence of the transition. Still, the speed of the transition would in many cases gloss this shortcoming over.

Wheels of Industry

(Continued from Page 404)

for any printer, home-made or commercial.

The Fried printer is finding its way into the professional laboratories according to an announcement from that concern. It is naw being used by Pellex Film Company in Hollywood and the Regina Photoplay Company of Canada.

Leica Remote Control

● E. Leitz Inc. announce a Remate Contral for the Leica camera. It fits over the end of the Leica where the shutter winding knob is located. Twa strings guided over pulleys operate this mechanism; ane winds the shutter, and the ather makes the exposure. In this manner the photographer situated at quite a distance fram the camera, can expose an entire roll of fram 30 to 36 exposures. A series of photographs af the various actians af the animals can easily be tcken. Greater flexibility can be attributed to the Remote Control Device

when it is employed in conjunction with a long-focus objective. This will permit the camera to be placed at a greater distance from the scene of action. Undoubtedly the Remote Control Device for the Leica will be responsible for many interesting animal photographs. For more detailed information concerning this apparatus the reader is advised to write to E. Leitz, Inc.

Kodochrome 50' Rolls and Packettes

● Kodachrome is now available for movie cameras of 50-foot capacity.

Cine-Kodak Kodachrome Safety Film heretofore supplied only in 100-foot 16mm rolls and consequently limited to cameras with that film capacity, is now available in 50-foot rolls, or Packette film magazine.

Two New Fomo Books

● The Fomo Publishing Company hcs issued two new books on photography, one particularly on the use of the Leica camera.

Authored by Karl A. Barleben, Jr. F.R.P.S., Fomo has issued their latest book in their Leica series under the title "The Leica Data Book." This book sells for $1.00. It is the fourth edition and contains more than eighty pages.

Prominent in its table of contents is information on Lenses. Under Exposure Data it gives tables, f values, shutter speeds to stop motion, film speed ratings, Photoflash exposure table, Photoflood exposure table. etc.

Under Film Data it gives space to the various types of film available and in its chapter on filters it gives factors, lens stop compensation and other vital information. In addition to this it has data on projection and developing as well as other information that will undoubtedly prove valuable to the amateur.

The second book is entitled "Getting Ahead in Photography," and is authored by H. Rossiter Snyder. It sells for 75c and contains about 60 pages.

The book is divided into nine principal chapters. The first, "Devil in the Box," has to do with ideas and the camera itself. The second, "Pictures of Animals and Birds," is self-explanatory. The author has furnished several interesting illustrations in connection with this chapter.

Under the title of "The Charm of Character Studies" he has brought out interesting observations in addition to striking illustrations.

In his chapter "What to do About Landscapes" he will have many interested readers. This type of photography usually gets under the hide of every amateur sooner or later.

The chapters "Practical Value in Freak Photographs," "Photographs of People," "When Your Subject is Not Moving," "Photographic Significance, Emotion, Effect" and "Something About Tripods" are all subjects treated in his individual style.

Los Angeles Processes Kodochrome

● The Los Angeles 16mm Laboratory has been equipped for the processing of Kodachrome Film. This is the only laboratory at the present time other than the home office laboratory in Rochester that is prepared to do this work. It is understood Eastman will equip some of their other processing stations with this equipment soon.

HERE'S HOW

WHERE can I purchase the color chart used in recent article on "Common Sense Filtering"?
—A. J., Chicago.

This chart is made by Milton Bradley Company, Springfield, Mass., and can be obtained from them or any school supply store. It is used in schools for "Color Education," contains all of the primary colors and a very good imitation of the solar spectrum. It also has a range of rays which can be used for a reference.

—Wm. Stull, A.S.C.

HERE is a piece of information on splicing Kodachrome film sent us by an interested amateur reader that will undoubtedly prove valuable to users of Kodachrome film.
—Charles Clarke, A.S.C.

"While editing some of this newer type film the other evening I found that the Blue-green image emulsion which comes next to the safety film support, was a tough one to remove. Any reader of this account of mine may better understand what I mean by the Blue-green image emulsion if he will turn to page 209 of the May 1935 issue, American Cinematographer.

"Water seemed to be of very little help in removing the blue coating. To keep on using the scraper was to take a chance on damage to the film support. To overcome this, I found that if the Yellow and Magenta emulsions were removed with the help of water and the film dried with a clean cloth, the last emulsion of Blue-green could be given a light coat of Film Cement in place of water and the scraper put into action once again. It was found that the film cement worked on the Blue-green emulsion and made it very easy to remove without damage to the film base. The splice was then continued in the regular way. This process saves me much time and loss of film."

—George F. Ryan, Pittsburgh, Pa.

Here's How

(Continued from Page 413)

HOW can I get more contrast in my titles? That is, I want to get black and white titles that sparkle.

—A. R. C., Hoboken

From what you tell us of the stock you are using we would say that some of the fault lies in that. The very best black and white titles are usually made with positive stock. If you will place two photo flood lamps about twelve inches from your title card you can give an exposure of about f:8 and secure a very contrasty title. You should use a good contrasty developer. Eastman D. 11 will prove very satisfactory. Following instructions as to time and temperature, you will not be disappointed in the result.

WHAT is your suggestion of following Cinematography as a profession and what are the possibilities of getting a job with a studio in Hollywood? I have done amateur work for 10 years and many claim I show fine promise and my pictures are comparable to some professional pictures.

—L. C., Denver, Colo.

Whether you should follow the profession of cinematography is hardly for us to answer. The only thing we can tell you is of conditions here in Hollywood and what your possibilities are of getting into the studios. We are glad to answer this in Here's How as hardly a week passes that we do not get a similar letter from an ambitious amateur.

We would say your chance for securing employment in the studios is almost nil. Hollywood has a surplus of comeramen and these men are not only familiar with the studios, but have been trained in the routine of the various studios with which they have worked.

The possibilities of getting work in other departments are no better as they also have people on the waiting list who have had a wide experience in the studios.

We would strongly urge that you stay where you are and hold on to your present job.

—John Arnold, A.S.C.

WHERE can I secure lens with a diopter rating as called for in one of your articles some time ago on building a titler?

—S. R., Philadelphia

As a general rule you can secure all of the lenses you will want with the ratings you may wish to use from the 5 and 10. On their spectacle counter you will find spectacles of various diopter ratings. These spectacles are marked let us say with a 1.00. That means one diopter. With this one is marked 40 which means it has a focal length of 40 inches. We believe you will find them from a half diopter up to 5 diopters.

—L. Guy Wilky, A.S.C.

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DE BRIE Parvo Metal Camera. Less than 1,000 feet shot. Internal Automatic Shutter Dissolve, Masks, 5CM-F3:5, 15CM-F4:5 Zeiss Lens. 6 Magazines, Rewind Block, Filter Holder. Sun Shade, Akeley Precision Pan and Tilt Tripod, Fast Pad Attachment. Camera, Magazine, Tripod Cases, Harry Van Gorder, 13521 Euclid Avenue, East Cleveland, Ohio.

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35 and 16mm travel and general interest films from India, one reel or shorter. R. C. Rigordy, 179 Lower Circular Road, Calcutta, India.

SILENCED Bell & Howell with new Fearless Movement 40, 50, and 75mm F. 2.7 lenses mounted. 2 1000-ft. Magazines, tripod, finder and sunshade. Perfect condition. Motion Picture Camera Supply, Inc., 723 Seventh Avenue, New York City; Cable: CINECAMERA.

230-degree shutter Akeley Camera X134, special focus on film attachment. 2-, 4-, 6-, and 12-inch lenses. Four 200-foot magazines, Akeley tripod, cases. Motion Picture Camera Supply, Inc., 723 Seventh Avenue, New York City; Cable—Cinecamera.

NEW type Super Parvo DeBrie ultra silent with built-in motor automatic dissolve, pilot pins, anti-buckling device. Four 1000-foot magazines, DeBrie friction tripod, finder, all accessories. Latest type equipment like new. Motion Picture Camera Supply, Inc., 723 Seventh Avenue, New York City; Cable—Cinecamera.

ARTREEVES latest 1935 portable double sound recording unit with double sprocket recorder, automatic speed control motor, twin fidelity optical unit. Latest type camera motor. New type microphone. Complete factory guaranteed, $2,400. This is the only authentic ArtReeves equipment for sale in Hollywood outside factory. Camera Supply Co., Ltd., 1515 Cahuenga Blvd., Hollywood, Calif.

16mm Films Exchanged, Sold, Bought, Cameras, Projectors, Sound Films. Write me first. ROBERT BLOCK, 1451 Broadway, New York City. M

WANTED

Bell & Howell Cinemotor. Must be cheap. Box 252, c/o American Cinematographer.

16mm Printer similar to ARRI, new or second-hand. State condition and price. A. B. Henwood, P.O. Box 868, Keilogg, Idaho. 8

Roll Film adapter for Dallmeyer speed camera, 1⅝"x2¼". Box 248, c/o American Cinematographer.

WILL PAY CASH FOR: Bell & Howell, Mitchell, Akeley or De Brie Cameras, lenses, motors, parts and accessories. Motion Picture Camera Supply, Inc., 723 7th Ave., New York, New York. T

Amateur Movie Contest

The annual American Cinematographer Amateur Movie Contest will close this year on November 30. That is, all entries must be in our office on that date.

As usual the members of the American Society of Cinematographers will act as judges.

There will be four outstanding prizes. None worth less than $150.00.

THE GRAND PRIZE will be.....$250 cash
EASTMAN KODAK CO. offers.....$150 in Equipment
BELL & HOWELL offers.....$150 in Equipment
VICTOR ANIMATOGRAPH offers a Model 4 Camera complete with f 2.9 Focusing Mount, 1" Lens and a No. 1 Carrying Case, value $147

It isn't too late to start your picture now if you haven't already done so. It can be in as many reels as you wish, it can be either 16mm or 8mm. Write for more information and Entry Blank.

CONTEST EDITOR
AMERICAN CINEMATOGRAPHER

6331 Hollywood Boulevard Hollywood, California

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